

RECORD



F. R. Fosberg

Collection and Field Note Book

No. 78 (Ctd.)

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# Collection and Field Note Book

No. 78  
( Aug. 25, 1965 - ~~Oct. 2, 1965~~ May 2, 1966)

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E N D



F. R. Fosberg  
Field Notebook #73

begin with # 47482

Ends with # 47777

start Koror, Palau Is.

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Palau

1

Cratogeomys ~~adpsa~~  
adpsungel

fruit eaten raw when ripe.  
bark used to reduce  
swelling as poultice.

Artocarpus - baramich

Cerbera amerida

Eurya eskeek  
hard wood used for axe handles <sup>also for tea</sup> for weakness

Phyllanthus ~~eskeek~~ dudurs  
means sleepy or lazy

Symplocos ~~eskeek~~ uptrui  
wood for small parts of  
canoes.  
used medicinally - for "rimbis"  
<sup>prob. name for disease.</sup>

after adoption of baby, lvs. are  
crushed mixed with water,  
given to baby ~~and~~ to <sup>mother</sup>  
make baby attached to parents.

Wikstroemia tebudel aran  
japanese collected bark. 70c lb.

Rhus ewis or ewes

Lynx kenden  
nchedalak  
~~or~~ nchedalak



1945 Caroline Is.

*Eugenia* n. keseeh  
fruit eaten when ripe  
yellow-red.

~~Rehderia~~ *Belvisia* ligarbedan

*Freyxinetia* soul  
ioul

*Ficus* ram. kulul

*Pouteria* alangaf  
fruit eaten when ripe  
very hard wood  
used for handles.  
ly pigeous

*Caesalpinia* toomulib

*Serianthes* ukal'le

*Gmelina* laeus  
la eoz  
wood for house constr.

*Actin?* kalngelband

Palau

Ngarmid, Koror.

*Maranta* - sui

*Vitex* beokku  
n bars  
wood for construction

*Neris* dub  
used for fish poison

75 69  
lild  
ulse edul  
magail

korua

lou belu

kalnabatel

usum



75 69



325)

Lupe

Sablon

Micro Airlines



1945 Caroline Is.

*Eugenia* n. kesee  
fruit eaten when ripe  
yellow-red.

~~Rehderia~~ *Belvisia* ligarbedan

*Freycinetia* soul  
ionul

*Ficus* ram. kulul

*Pouteria* alangel  
fruit eaten when ripe  
very hard wood  
used for handles.  
by pigeons

*Casalpinia* toonulib

*Serianthes* ulsal'le

*Gmelina* la eus  
la eoz  
wood for house constr.

*Artocarpus*? kalngelband

Palau

Ngarmid, Koror.

*Maranta* - sui

*Vitex* beoklu  
" bars  
wood for construction

*Neris* dub  
used for fish poison

~~*Schuyleria*~~ *Schuyleria* lime  
bamboo - lild

*Vitex* neg. kulse edul

sub. ongail

*Cassia* occ. borua

*Stachyophora* low belu

*Gmelina* kalnabatep

*Eschscholzia* col. usum



Labels  
typed

Aug 25 - Ngarmid,  
Koror Island  
at base of limestone  
cliff in elevated wave  
cut notch.

47482

Cyrtandra

6

locally common

3

83

Codiaeum

rare on ledges

4

84

Tectaria

common on ledges and  
slopes of weathering limestone

85

Asplenium

very local on wet rough  
limestone

6

86

Peperomia

locally abundant on  
ledges

4

87

Polyscias grandifolia  
on talus

5

88

Asplenium

occasional on ledges

10

89

~~Anthropteris~~? Cyclopteris kingivery common on vertical  
faces and ledges.

4

90

(aroid)

common, climbing on trees

4

91

Elatostemma

common on ledges

3

92

Ophiomhiza  
very local

30 m.

unbranched or almost  
so, 1-2 m. long; flowers  
white, fleshy, funnelform,  
regular; fruit white,  
fleshy, broadly ovoid.  
sterile shrub. leaves  
variegated.

fleshy, procumbent.

unbranched shrub,  
oily fragrance when broken.

sterile vine

stem fleshy, much  
branched at base, up  
to 0.7 m long

slender shrub, to 0.7 m tall;  
leaves white beneath.



Labels typed

1965 Caroline Is.

47493

10

same - in village  
*Eugenia aquua*  
 commonly planted

same - in fallow fields  
 and thickets

6 94 *Desmodium heterocarpon*  
 var. *strigosum*

locally common in fields

5 95 *Cassia mimosaoides*  
 locally abundant  
 in fields

2 96  
 rare

2 97 *Vitex negundo* var. *bicolor*  
 in thickets

3 98 *Fimbristylis*  
 locally common in  
 open places

2 99 *Schizostachyum*  
 occasional

47500 *Derris elliptica*  
 occasional

6 01 *Leucaea*  
 very local in trail in open place

5  
 small tree, 5 m. tall  
 fruiting abundantly,  
 fruit, bright pinkish  
 red, pleasantly acid,  
 crisp. "edepsachel"  
 fruit commonly eaten

25 m.

shrub 1.5 - 2 m. tall,  
 flowers purple.

herb to 1.2 m. tall,  
 flowers yellow.

erect very thorny  
 shrub 2.5 m. tall,  
 sterile.

sterile shrub  
 "kulse edul"

tufted

forming dense clumps  
 of hundreds of stems;  
 internodes about 0.5 m long.  
 "lild"

woody vine; leaves  
 glaucous beneath.

"dub" used for fish poison,  
 prostrate, forming mats;  
 flowers white.



Palau  
typed 8

1965 Caroline Is.

- 47502 *Ischaemum*  
5 dominant in open areas,  
forming dense stands
- 9 03 *Vitex*  
occasional in thickets
- 4 04 (marantac.)  
uncommon

Aug. 25 - Malakal Island  
in forest on slopes of hill on volcanic  
soil

- 5 05 *Eurya nitida*  
common
- 4 06 ~~*Belvisia*~~ *Cerbera*  
common

- 3 07 *Artocarpus cf. heterophylla*  
one tree seen in clearing
- 2 08 *Timonius*  
rare in undergrowth
- 1 09 *Belvisia spicata*  
occasional, epiphytic on tree  
trunks

Palau

9

erect, 1-1.5 m. tall.

small tree (said to  
grow to timber size);  
flowers lavender;  
"beoklu" or "bars"  
wood valued for  
construction, said to be  
light and strong.

shrub 1.5 m. tall,  
densely branched  
and tangled, flowers  
white "sui"

wood very hard, used for axe  
handles; leaves used for  
tea for weak people.

- 30 m.  
↓  
small tree; flowers  
white faintly ill-scented;  
fruit immature. "especk"  
small lactiferous  
tree; flowers white  
with greenish yellow  
~~eye~~ center, tube  
somewhat dilated at  
top. "amerida"
- 20 m.  
— sterile small tree,  
lactiferous "baramich"
- 100 m.  
— small shrub; flowers  
white.  
↓  
"ligarbedan"



Calley  
typed

10

1965 Caroline Is

47510

*Eugenia*

8

dominant shrub or small tree in undergrowth

2

11

*Vittaria*

epiphytic on tree trunks

10

12

*Pouteria obovata*

common

1

13

*Alpinia*

occasional

6

14

*Randia cochinchinensis* (Lour.) Merr.

occasional

3

15

(orch.)

very local, on rock outcrop

5

16

(orch.)

very local, on rock outcrop

2

17

*Grmelina*

rare

~~47511~~

17

18

*Serianthes kanehirae* Forb.

occasional

8

19

*Wikstroemia elliptica* Merr.

occasional

Palau

11

shrub; ripe fruit bright orange-yellow "keseeel".  
ripe fruit eaten.

110 m.

tree 10 m. tall; fruit immature, said to be eaten by fruit pigeons  
"langel" wood used for handles.

100 m.

canes 1.5 m. tall; fruit immature.

↓

shrub 2.5 m. tall; fruit mostly immature, ripe one red.

~~decumbent~~ prostrate, fruit immature.

~~flowers~~ stems erect or arching, flowers green, slender sparsely branched shrub 2.5 m. tall, trunk very

110 m.

thorny, sterile. "Kalingebard" large widely spreading tree, 15 m. tall, trunk 0.5 m. thick; corolla and stamens cream white; pods from ground beneath tree. "ukal"

50 m.

shrub 3 m. tall, ~~fruit~~ mostly flower greenish yellow. fruit mostly immature, ripe ones red "tebudel aran". Japanese collected bark, said to be 20 yen per lb.



Labels  
typed  
12

1965 Caroline Is.

- 47520 *Antrophyum reticulatum*  
2 epiphytic on tree trunk, common  
1 21 *Ophiorhiza pendulum*  
epiphytic on tree trunk  
14 22 *Gmelina palauensis*  
common  
9 23 *Lumnopora*  
common  
7 24 *Phyllanthus*  
common at edges  
of clearing

Labels  
typed  
1 25

Aug. 25 - Koror Town, Koror?  
*Clerodendrum*  
planted as an ornamental

Aug. 25 Ngerebe'ed, Koror?  
planted around Entomology  
Laboratory.

1 26 *Pongium edule*

(To p. 16)

Palau

13

75 m

↓

30-50 m

↓

wood used  
in house  
construction.  
tree 10<sup>15</sup> m. tall; flowers  
white with lower  
lobe erect, bright  
purple with yellow  
spot at base. "laos", "laen"  
small tree, fruit  
immature. "uptui"  
shrub 1.5 - 2 m. tall.  
"dudurs" (means sleepy or  
lazy). After adoption of  
a baby it is given  
water mixed with  
crushed leaves of  
dudurs to make the  
baby more attached  
to the parents.

wood used for small  
parts of canoes. used  
medicinally for disease  
called "rimbis" by Japanese.

5 m.

small shrub; calyxes  
dull reddish white,  
corolla scarlet.

10 m.

tree 10 m. tall, female flower green,  
fruit large, ellipsoid, pendent.



1965 Caroline Is.

Aug. 24 Risong, and up section

Enclosed, almost  
land-locked bay  
with tongue of volcanic  
rock protruding into  
it

Ophiorhiza maldia

Timonius

Allophylus -  
medicine for head

Salacia detinens

Derris. Goniokum

Soulamea diga merin

Centotheca - uyil  
haemostatic

rub on nail  
medicine for Tuberculosis

Ternstroemia bugitong  
(outer part)

Breclan kesiamel

that is obviously an extension  
of the tongue, a low convex  
mass like a section of a knoll  
a flat ridge. The rock here is a  
very hard tubb or volcanic breccia

photos

B. W. bet. Malakal Canal  
and Risong various  
views - mangroves & vegetation

Forest at Risong has  
a dense canopy but  
one can walk, or climb,  
freely anywhere  
except where a tree  
has been cut. Shrub layer very thin.

The Arthropteris, or  
whatever it is, is  
the most abundant  
fern, especially on  
vertical limestone  
and on small ledges  
or irregularities.

The bottom of the  
ravine that runs up  
from the tongue of volcanic  
rock has deep heavy  
soil. Considerable  
disturbance here.

The bottom of the almost  
enclosed lake is very  
muddy or marly,  
and much littered with  
trees and other debris.  
Much of the bottom is  
exposed at low tide.

Across from the tongue  
of volcanic rock, at the  
base of the limestone cliff, is an  
exposure of volcanic rock



47527 *Nymphaea*  
in small tank (brought  
from river in Babeldaob.)

28 *Eichhornia crassipes*  
~~planted~~ in small tank,  
floating

29 *Nymphoides*  
floating in small  
tank (brought from  
northern Babeldaob.)

30 *Jasminum*

31 *Passiflora foetida* var. *hispidula*  
occasional (abundant  
in some places)

32 *Cratogeomys* *speciosa* Volle

10m.

leaves very many  
from rhizome in mud  
on bottom, floating,  
flower 15-20 cm above  
water, bright  
crimson pink.  
flowers deep lavender.

scandent shrub; flowers  
white, corollas turning  
reddish pink after falling.  
vine; flowers white  
with purple corona,  
open in morning, closed  
by noon.  
shrub; "adpsungel"  
fruit eaten raw when  
ripe; ~~leaves used~~ bark  
used as poultice to  
reduce swelling.



Labels  
typed

1965 Caroline Is.

Aug. 26 - Rison<sup>K</sup>, on  
south side of Aulupsechel  
Island  
in dense forest on  
steep rough limestone  
slopes

47533

Pavetta or Tarenna  
one tree seen

59

6 34 *Randia cochinchinensis* (Lour.) Merr.  
occasional in tall shrub  
layer

4

35

(fern) <sup>marly</sup>  
very common on wet cliffs  
~~of *Pandanus* <sup>marly</sup>~~

7

36

*Ophiorhiza*  
very common on ground

5

37

*Psychotria*  
common in shrub layer

5

38

*Guettarda speciosa* L.  
occasional

2

39

*Asplenium*?  
occasional

1

40

(rub.) (*Guettarda*?)  
one only seen

1

41

*Malaxis*?  
one only seen, on ledge in  
ravine

5

42

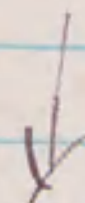
*Vittaria*  
common on rotting log

1

43

*Eugenia*  
common in shrub layer

30-50 m.



tree 15 m. tall, 25 cm dbh.,  
flowers white, turning  
yellow with age; fruit  
immature.

slender shrub 4 m. tall;  
fruit immature.

suffrutescent herbs 20-  
30 cm. tall, <sup>leave white beneath,</sup> ~~P~~ corollas  
white.

slender shrubs 1.5-2 m.

tall; fruit immature.

tree 25 m. tall, 15 cm. dbh.,  
flowers white.

all seen sterile.

seedling

flowers maroon

slender shrub 2 m. tall,  
flowers white.



20

1965 Caroline Is.

- 47544 *Lastrea*  
occasional on marly cliff
- 1 45 *Asplenium*  
rare on marly cliff
- 2 46 *Nepenthes mirabilis*  
occasional on cliffs  
and climbing into trees
- 5 47 *Ficus*  
occasional
- 4 48 *Hymenophyllum*?  
very local on rotting  
branch in deep shade
- 1 49 *Trichomanes omphalodes*  
very local on rotting  
branch in deep shade.
- 1 50 *Hymenophyllum*?  
local on rotting branch.
- 2 51 *Nerwillis aragoana* Gaud.  
common in deep ravine  
bottom on heavy soil.
- 4 52 *Hemigraphis*  
common
- 1 53 (rub.)  
rare
- 7 54 *Psychotria*  
common in shrub layer  
this on a ledge.

Palau

21

woody vine many  
m. long, pitchers on  
short lateral branches;  
sterile.

slender shrub 3 m. tall,  
possibly a seedling  
of a large strangling  
species seen nearby.

sterile, leaves gray-green,  
semi-translucent.

corolla white, readily  
caducous.

seedling 1 m. tall, sterile;  
"ongail" used medicinally  
for tuberculosis.

shrub 2 m. tall; flowers  
white, 4-pid; fruit immature.



Saville  
typical

1965 Caroline Is.

same - in mouth of  
deep ravine, on heavy soil.  
*Centotheca lappacea*  
common

47555  
4

5 56 *Lactuca*  
occasional  
2 57 *Lactuca*  
very common ~~on~~ semi-open  
debris fan.

2 58 *Costus*  
occasional on semi-open  
debris fan.

2 59 *Alpinia*  
common on semi-open  
debris fan.

2 59a *Wedelia bipflora* (L.) DC.  
common ~~on~~ semi-open debris fan.  
same - (as 47533-54)

3 60 *Boerlagiodendron*  
occasional on steep slope

same - on <sup>limestone</sup> cliffs just  
above the sea

14 61 *Salacia*?  
common

2 62 (var.)  
rare

rough  
in limestone

10-15 m

↓

culms decumbent to  
ascending; "ujil" broken  
stems said to be effective  
to stop bleeding of small  
wounds.

rhizome short, prostrate,  
fronds almost erect.  
fronds erect, tips arching.

spiral stem 1 m. tall,  
flower white, ~~calyx~~  
slightly pinkish,  
calyx green in flower,  
red in fruit.

leafy canes ~~2 m~~ 2 m  
tall, fruit yellow,  
turning red.

spreading herb, heads yellow.

small tree 6 m. tall,  
branches few, thick,  
flowers dull coppery red,  
pedicels thickened upward.  
"kesiamel".

2 m  
↓

vine tangled in trees  
and bushes, perianth yellow-green,  
reflexed. "detimel".

large ~~spreading~~ <sup>twisted</sup> shrub,  
fruit immature.



Labels typed 1965 Caroline Is.

24

- 47563 *Allophylus timnensis*  
 5 common  
 3 64 *Ophiontias*  
 occasional  
 12 65 *Genivratoma*  
 common  
 2 66 *Peperomia*  
 very local  
 1 67 *Maytenus*  
 occasional  
 6 68 *Hedyotis albido-punctata* (Mey.) Forb.  
 common  
 10 69 *Timonius corymbosus* var. *Tabernaemontani*  
 occasional  
 2 70 *Pyrosia lanceolata*  
 epiphytic on tree trunks  
 1 71 *Psilotum nudum* (L.) Beauv.  
 epiphytic on tree trunks

Labels typed and  
 G. Adelbair

- 8 ↓ 72 *Premna obtusifolia* R.Br.  
 probably spontaneous

- 10 73 *Gmelina*  
 spontaneous in hedgerow

Palau

said to be used as headache medicine

25

- tangled shrub, flowers white, fruit green.  
 leaves white beneath "meldi"  
 shrub; flowers white, fruit immature.  
 fleshy, decumbent.  
 semi-scandent shrub.  
 diffuse; ~~flat~~ leaves subfleshy; flowers white.  
 curved shrub or tree, 6 m. long; flowers white, monoecious?

10 m  
 ↓

- small tree about 8 m. tall, twigs dark brown with white speckles; flowers pale green, weakly but unpleasantly aromatic; fruit black when ripe; "osrem" used medicinally chewed and applied to wounds.  
 small tree with long branches, spiny twigs & lower branches; corolla yellow, curved; fruit fleshy, very bitter and sour. "kalnabatel"



Labels typed  
26

1945 Caroline Is.

47574 *Stachytarpheta urticifolia* Sims  
weed

3 75 *Echinochloa colonum* L.  
weed in taro patch

3 76 *Spermacoce suffruticosa* Jacq.  
weed

4 77 *Crotalaria spectabilis*  
weed

3 78 *Crotalaria incana*  
planted

1 79 *Crotalaria mucronata*  
planted

Aug. 28 - same

8 80 *Glochidion*  
probably spontaneous

8 81 *Glochidion*  
probably spontaneous

Labels typed  
Aug. 29 - Malakal Island  
in and around quarry in  
volcanic breccia

6 82 *Synedrella nodiflora*  
common along roadside near

5 83 *Melochia*  
in thicket

6 84 *Glochidion*  
common in thicket

Palau

27

suffrutescent herb 1 m. tall,  
flowers dark blue.  
"lo belu"

"usum"

flowers pinkish-white,  
hairy within.

herb 1.5 m. tall, flowers  
bright yellow.

erect herb 1.5 m. tall,  
flowers yellow.

herb 1 m. tall; flowers  
yellow with brown striations.

spreading tree with drooping  
branches, yellow staminate,  
green pistillate flowers,  
green dehiscent capsules,  
red aillate seeds.

~~tree~~ tree, flowers green

15 m.

erect herb; heads  
yellow, rays few and short.  
tall shrub 4 m. tall;  
flowers magenta  
small tree 5 m. tall,  
flowers yellow-green, pistillate  
with red base.



Salisbury typed  
28

1965 Caroline Is.

47585

*Cassia leschenaultiana*  
occasional on talus

3 86

*Pteris vittata*  
occasional in crevices  
in quarry wall

8 87

*Trema*  
common on talus

2 88

*Ischaemum muticum*  
common on talus

6 89

*Emilia sonchifolia* (L.) DC.  
common

Quarry exposes a  
dome of volcanic  
(explosion?) breccia  
with angular chunks  
of basalt embedded  
in a somewhat yellowish  
fine matrix.

Over this is a finely  
bedded ash or other  
very fine-grained rock,  
very much weathered  
but showing an almost  
phyllitic structure.

~~Over this~~ Over this is a  
deeply weathered  
material, probably tuff.

The plants are all  
weedy or second-growth

Palau

29

much branched suffu-  
tescent herb, 1 m. tall,  
flowers yellow.

small shrubs to  
small trees: leaves  
green above and beneath,  
ripe fruit yellow.  
culms erect.

herbage somewhat glaucous,  
heads purple, disk flowers  
little exceeding involucre.

species.

Around the end of the  
island from the quarry,  
facing both Malakal  
Harbor and the pass west  
of Urukthapel is a stone  
wharf and about 2.5 fathoms  
of water, and perhaps  
10 acres of filled land-  
flat, covered by secondary  
vegetation. An old but  
very substantial, bombed  
but not greatly damaged  
Japanese building is here. This  
area available for Marine  
lab. site.



## Tor Uil Island. (near Malakal)

Lany. ~~Mauek~~  
Fuovel

Desmod. umb. babler

Antidesma detimed

Chloranth. Eloosengel

Phaleria Tabudel ingait

bark used by Japanese

for <sup>making</sup> paper mowers

medicinal tea made from leaves.

leaves eaten for cathartic

Ficus o'orso

spiral orchid oloteodin

Pisonia Ududh  
Tarabagai

Carpodium Butaria

What appears to be Trichosanthes  
but is sterile is common.  
The Procris is of amazing  
luxuriance.

After drenching rain for  
3 days, it mostly just looked  
threatening today - "stabilized" Bof Owen

This island is the  
part of Aulupre'el cut  
off by the canal from  
McDuck to Malakal Harbor.  
The old trail from the road  
has collapsed at the

d near the road and  
impassable. The

all below, built by  
Japanese, can be  
albed over and at it

d is a path up to the

it. This trail goes

ra low saddle from

hence it depends to

a sink-hole lake.

on the saddle on

o has been profound

sturbance, either

aring or more than

rat typhom damage.

se even a few poor

the corms planted

the semi-open area.

sarea is completely

bed with a waist

head high mass of

ephrrolepis, Lactuca,

Procris pedunculata,

and various lianas.

Piper, Dioscorea, Denis

tripoliata, etc. Small

Macaranga saplings

are very common.

1-2 m

Caroline Is. Palau  
Aug. 30 Tor Uil Island,  
bet. Koror and Malakal,  
in dense tangled vegetation  
on very disturbed low ground near sink-hole.

47589a Denis tripoliata

tangled liana



Cardinal Is.

Palau

Aug. 30 Tor Ulil Island,

1-2 m

bet. Koror and Malakal,

in dense tangled vegetation

on very disturbed low ground near sink-hole.

47589a *Demis trifoliata*

5

tangled liana



7 or 8 Island. (near Malakal)

Lany. ~~Maivet~~  
Muovel

Desmod. umb. babler

Antidesma detimed

Chloranth. Eloosengel

Phaleria Tabudel ngait

bark used by Japanese  
for <sup>malware</sup> paper makers  
medicinal tea made from leaves.  
leaves eaten for cathartic

Ficus o'orso

spiral orchid olotesdin

Pisonia Ududh  
Tarabagai

Carandrum Butarai

What appears to be Trichosanthes  
but is sterile is common.  
The Procris is of amazing  
luxuriance.

After drenching rain for  
3 days, it mostly just looked  
threatening today - "stabilized" Bob Owen

This island is the  
part of Aulupre'el cut  
off by the canal from  
McDoch to Malakal Harbor.  
The old trail from the road  
has collapsed at the  
end near the road and  
is impassable. The  
wall below, built by  
the Japanese, can be  
walked over and at its  
end is a path up to the  
trail. This trail goes  
over a low saddle from  
whence it descends to  
~~the~~ a sink-hole lake.  
From the saddle on  
there has been profound  
disturbance, either  
clearing or more than  
usual typhoon damage.  
There are even a few poor  
little coconuts planted  
in the semi-open area.  
This area is completely  
choked with a waist  
to head high mass of  
Nephrolepis, Lactuca,  
Procris pedunculata,  
and various lianas -  
Piper, Dioscorea, Doris  
trifoliata, etc. Small  
Macaranga saplings  
are very common.



Labels  
typed

1965 Caroline Is.

Aug. 30 - Tor Uil Island,  
between Koror and Malakal  
in dense scrub-forest  
on steep rough limestone  
slopes

47590

*Trichosanthes*

occasional in disturbed  
semi-open areas

5

91

*Vittaria elongata incurvata*  
occasional, epiphytic on  
tree trunks.

20

92

*Stereulia*  
occasional

2

93

*Vitex*

occasional, sprouts only  
seen

6

94

*Pisonia umbellifera*

one broken tree seen in  
semi-open disturbed area  
with *Macaranga*.

2

95

*Clerodendrum speciosissimum* var. *great*  
occasional in semi-open  
disturbed area.

1

96 (orch.)

in undergrowth

2

97

*Ficus*

common, but only sapling  
seen.

2

98

~~Lastrea~~ *Lastrea*

occasional in somewhat  
disturbed area

15 m



sterile herbaceous vine  
at least several m long.

20 m

tree 20 m. tall; flowers  
straw color.

15 m



sterile sprouts, 1-2  
m. tall.

clump of large sterile  
sprouts from stump.  
"Uduidh arabagai"

shrub 2-3 m. tall,  
sparsely branched. leaves  
foetid when rubbed;  
flowers scarlet.  
stem erect, spirally  
curved; "olotes din" leaves  
used in making ear  
ornaments in old days.

sterile shrub, said to  
reach great size. "o'orso"



47599 *Dioscorea bulbifera* L.

rare in disturbed area

47600 *Phaleria*

rare

7 01 (encl.)  
occasional

6 02  
common hanging  
just over water

6 03 *Desmodium umbellatum*  
common, hanging just  
over water.

3 04 *Maesa*  
rare tangled in shrubs  
hanging over water.

Aug. 31 - Malakal Island,  
Fisheries Wharf  
in weedy places around  
buildings

3 05 *Muntingia calabura* L.  
occasional

twine, bearing aerial tubers.

shrub 3-4 m. tall,  
bark very tough; buds  
white, "tabudel ongail" or

said to be of great  
medicinal value; leaves  
eaten as cathartics, or  
made into a strong tea.  
The Japanese were said to  
have exported the tough  
bark to make paper

money from.  
shrub 2 m. tall,

"eliosengel"  
large arching shrub,  
leaves gray-brown  
sericeous beneath;  
flowers very small, green.  
"inovel"

shrub; leaves slightly  
glaucous beneath. "babeu"

shrub, flowers pale  
greenish "detimel" fruit  
eaten when ripe.

2 m  
↓

shrub 3 m. tall; petals  
white



- 47606 *Chloris ~~pergr~~ inflata* Link  
very common  
2  
1 07 *Phyllanthus*  
locally common  
3 08 (grass)  
common  
4 09 (legum.)  
occasional  
3 10 *Phyllanthus debilis*  
occasional  
2 11 *Euphorbia chamaecyp*  
common  
1 12 *Spermacoce*  
rare  
3 13 *Cynodon dactylon*  
locally common

Aug. 31 - Pelline Island,  
north ~~end~~, at  
boat landing, weedy  
roadside, coral soil.

- 6 14 *Scoparia dulcis*  
common  
3 15 *Lippia nodiflora* L.  
common  
6 16 *Spermacoce*  
very common  
6 17 *Cyperus*  
very common  
2 18 *Pluchea indica*  
occasional, near shore  
7 19 *Stachytarpheta urticifolia* Sims  
occasional (to p. 40)

culms from root crown,  
base decumbent, culm erect.

culms ascending

branching herb 0.8 m. tall,  
flowers yellow.

stems red, leaves purplish  
green, sub-prostrate.  
flowers white.

prostrate, with forming  
a mat, with erect flowering  
culms.

2 m.

erect

stems ascending,  
flowers white.  
flowers white.

small tufts, culms erect.

small bush 0.6 m. tall,  
much branched.  
much branched herb 1 m  
tall, flowers dark ~~blue~~  
purplish blue.



Aug. 31

photos  
 low & low several in islands  
 just north of s.w. tip of Unkithapel  
 Typical limestone islands.

## Pelilieu Island -

Terribly battered by  
 typhoon of November 1964.

A great many trees of  
 many kinds uprooted -  
 many of them Casuarina.

But many Casuarina  
 still standing, having  
 lost their smaller branches.

A great ~~lot~~ many tiny  
 branchlets have appeared  
 along the old branches  
 that remain.

A lush weedy ground  
 vegetation has appeared  
 in some places. Wedelia,  
 Leucaena, and Operculina  
 turpethum have prospered.  
 Also Moringa citrifolia.

The typhoon destroyed  
 all but one house on the  
 island. On the east  
 side water swept over  
 to 2 m. depth, in the village  
 one m or less. The taro  
 was completely destroyed,  
 (acc. Haruo Adellai). Sweet  
 potatoes are extensively planted.

also manihot. some bananas.  
 Winds said to have been  
~~35-125~~ 35-125 mph, but really  
 must have been more  
 than that.

## Sept. 1 - Pelilieu

Swamp back of village  
 filled around edges  
 with wreckage. Choked  
 with Clerodendrum  
 in nerve.

Along road Hibiscus and  
 the green Spermaceae  
 very abundant.

Stachytarpheta jamaicensis  
 and S. urticifolia common,  
 growing together, no  
 intermediates seen.

Portulaca grandiflora  
 seen growing in pot, flowering.

Cynodon very common.

Terminalia catappa still  
 standing, at least many of  
 them, branches pretty well  
 beaten off, but recovering.

Manihot and sweet potato  
 tend to be chlorotic locally.



- 47420 *Digitaria*  
common  
2 21 *Synedrella nodiflora* (L.) Gaertn.  
common

Aug. 31 - <sup>Ngalkol</sup> ~~Pelilio~~ Village,  
Pelilio Island  
on weedy roadside  
on coral soil

- 7 22 *Glochidion*  
single tree seen

- 3 23 *Lepidium virginicum* L.  
common in gardens and

- 3 24 *Sporobolus africanus*  
locally common

Sept. 1 <sup>Ngalkol</sup> ~~Pelilio~~ Village,  
Pelilio  
weedy roadsides  
and soil bare by typhoon

- 6 25 *Cynodon dactylon* (L.) Pers.  
very common

- 2 26 *Stachytarpheta jamaicensis*  
one plant of this form seen

- 4 27 *Fimbristylis cymosa* var.  
common locally

- 3 28 *Stachytarpheta jamaicensis*  
very common, growing  
with *S. urticifolia* without  
intermediates (unless 47626 is one).

- 4 29 *Fimbristylis cymosa* var.  
common locally (to page 48)

culms ascending to erect.

erect herb, rays few, short,  
yellow.

Tree 8 m tall, 3 dm dbh.;  
staminate flowers  
yellow, pistillate green,  
fruit green, even when  
dehiscing; seeds red.

in dense tufts.

"udel" (name for grass)

forming a mat-like sod,  
flowering culms erect.  
much branched low  
herb, flowers slightly  
darker blue-violet than usual.

"gareems" used in weaving  
hats, bags and mats.  
much branched herb,  
leaves dull green, flowers  
rather pale violet.

"gareems" used for weaving hats,  
bags and mats.



1965 Caroline Is

Sept. 1. Pelilu I.

Many small breadfruit trees still standing, most branches broken off, new ones appearing. Bananas seem to have recovered better than most other cultivated things.

Still standing -

Glochidion

Artocarpus

Casuarina

Pouteria

Eugenia

Terminalia

Arec (bears in 9 ms)

photos pod + b + w

taro pits choked with  
Thelypteris going  
some Cyrtosperma

Pipturus Alula agarasus  
used for relieving itching  
of chiggers "grasus".

Operculina per push  
leaves cooked and eaten  
with Tridacna also used  
to cover pork when cooking.

photos

b + w + pod

tree covered by Operculina  
tangles of Operculina  
and Wedelia in f.g.

Ficus - bulk  
fruit, formerly eaten.  
aerial roots used for  
tying things

Cananga odorata common  
badly beaten. aerial  
young tips eaten.  
fruits also.

Morinda "ngel"  
~~can~~ used to cure  
swellings - put coconut  
oil then morinda leave  
heated and applied  
Women use young leaves  
& buds crushed to rub men  
when having intercourse "malor men"  
buds + stipule crushed  
mixed with water, ~~used~~ drunk  
when someone falls from  
tree

Acalypha - klakel  
used for fertilizer in  
taro pits.

Quettarda - to 2.5 m. tall  
naturalized.



mangrove (Bruguiera)  
mostly dead, a  
few individual  
seem healthy perhaps  
5%.

glover. tarararii

Casuarina rooted on  
compacted coral all blown  
down

lace. spout -  
intr. in Jap. time  
eaten by horses.

Plant around village

Hypericaceae suff. ogolabulu  
~~Chloris~~  
Lepturus - udel  
Cynodon  
Digitaria  
Fimbristylis cym. gareems  
used in weaving hats  
bags + mats.

Clavd. inerm embret  
used medicinally  
and fish poison (leaves)

Euph. chamosyae olumuf

Andropogon  
horse feed  
plant  
ngelela adeef  
stomach medicine

Glochidion ngolem  
wood for houses  
used mixed with  
other plants for medicine.

Lippia ~~oburiga~~  
used medicinally,

Cyperus kareems

Hyndrella mals  
used medicinally

photos from Kod and both rolls begin  
various typhoon damage  
and rank secondary growth  
+ dead mangrove

This island, after the typhoon,  
looks reminiscent of its aspect  
right after the war. Many  
trees are down. Standing ones are  
mostly devoid of smaller  
branches or there are leafless.  
Apparently the wind simply  
whipped the smaller branches to  
death. Secondary forest is in  
many places simply blown down.  
No large Macaranga seen, but  
many small ones. Some areas  
are a mat of fallen small trees,  
seedlings, and vines.  
Mangroves are mostly dead.



1965 Caroline Is.

Lerenty Is.

photos  
of  
Dad

views from boat.

Pemphis & Flagellaria  
in cliffs - Scaevola,  
Banksia

Palms locally dominant  
esp. on lower slopes and  
low islets. Dracaena also  
Portulaca common.

Intsia

Freus. unct.

F. micrantha

Guettarda

pinner - min

Small beach with  
a few coconut trees  
Cordia, Tournefortia, Ternstroemia  
Intsia, Hernandia, Myrsine

This nature reserve  
is a somewhat isolated  
group of rather small  
islands, probably not  
more than 200-250' high,  
very rugged. They are  
drier than the larger ones,  
and the vegetation is largely  
scrub-forest. Vines are  
abundant but the under-  
growth is sparser. On  
lower slopes and smaller  
islets the palms - Gulubis,  
esp. form dominant stands.  
Dracaena is abundant.

There are a number of  
small white fine sand  
beaches with strand  
forest and a few coconuts.

The limestone on the one  
climbed tends to be ~~thin~~  
rotten, very finely  
pitted, readily breaking  
off. At the top it is  
excessively rugged.  
Then the scrub is rather  
low and thin.



- 47630 *Hedyotis corymbosa* (L.) Lam.  
locally common
- 6 31 *Lepturus repens* var. *repens*  
abundant, covering ground
- 6 32 *Acalypha amentacea* var.  
common
- 5 33 *Thermacoe suffruticosa* Jacq.  
locally common on bare soil

Sept. 1 Peliliu Island  
south ~~part~~ <sup>north-east end of</sup> near air strip  
in disturbed ground  
along roads.

- 6 34 *Saccharum spontaneum* L.  
very locally common
- 1 35 *Coryza boraniensis* (L.) Crong.  
one plant seen
- 2 36 *Pluchea odorata* (L.) Cass.  
common
- 1 37 *Acalypha amentacea* var.  
common
- 6 38 *Timonius timon*  
locally common
- 6 39 *Timonius timon*  
locally common
- 3 40 *Timonius timon*  
locally common

prostrate, flowers pinkish  
white.  
stoloniferous. "udel" (general  
name for grass)  
shrub 1.5 m. tall, "klakel"  
used only for fertilizer in taro pits.  
leaves purplish; flowers  
pinkish white.

2-4 m.

more or less caespitose,  
erect, to 2.5 m. tall.  
"introduced in Japanese  
times, eaten by horses."  
"new since World War II"

shrub 2 m. tall, "new  
since World War II".  
shrub 1 m. tall. "klakel"  
used only for fertilizer for  
taro pits.  
sterile shrub 2 m. tall,  
said to have appeared since  
World War II.  
shrub 1.5 m. tall; flowers  
white, said to have appeared  
since World War II.  
shrub 2 m. tall; fruit  
immature, said to have  
appeared since World War II.



Salisbury  
50

1965 Caroline Is.

- 47641 *Ficus microcarpa* var. *latifolia*  
occasional  
1 42 *Ficus microcarpa* var. *latifolia*  
occasional  
2 43 *Horsfieldia*?  
common in thickets  
4 44 *Morinda citrifolia*  
very common generally

- 2 45 *Operculina turpethum* (L.) Manso  
abundant, blanketing  
thickets and trees

- 1 46 *Conyza canadensis*  
rare on bare ground  
4 47 *Pipturus argenteus* var.  
occasional

same - in swampy back of village

- 5 48 *Clerodendrum inerme* (L.) Gaertn.  
abundant

Palau

51

- fruit immatures.  
both { banyan type tree, "lulk"  
fruits formerly eaten,  
aerial roots used for tying  
things.  
small tree, sterile. "ersa'al"  
young tips and fruits eaten.  
shrub 3 m. tall, leaves  
glossy; collars white.  
"ngel" leaves heated  
and applied with coconut  
oil to swellings; stipules  
and buds crushed or  
chewed, mixed with water,  
drunk when a person falls  
from a tree; young tips  
leaves crushed by women  
and rubbed on genitals  
of self and partner,  
said to "make man  
forget everything."  
huge vine, stems  
sharply 5 angled; flowers  
not seen but said to be  
white. "per push" leaves  
cooked and eaten with  
*Tridacna*, also used to  
wrap pork for cooking.  
said to have appeared only  
recently.  
shrub 2.5 m. tall, leaves  
green beneath. "olulu agaramu"  
used to relieve itching from chiggers (garamu).  
tangled shrub, flowers white with  
maroon stamens and pistil. "embreit"  
used as medicine and as fish poison.



*Labels typed*

Sept. 1 Orukwiza or  
"Seventy Islands" Nature Reserve.  
easternmost large island  
on steep slopes and  
cliffs of very rough  
limestone, dense scrub forest.

- 47649 *Eugenia*  
very common
- 6 50 *Bikkia*  
common on rocks and  
cliffs just above sea
- 4 51 *Tectaria*  
common on shaded rocks  
and cliffs
- 3 52 *Bikkia*  
on summit of island
- 1 53 (lichen)  
common on *Eugenia* branches.
- 1 54 (lichen)  
common on bark
- 2 55 *Alyxia*  
very common
- 1 56 *Flagellaria indica* L.  
common
- 2 57 *Cayratia*  
occasional
- 2 58 *Maytenus*  
common
- 2 59 *Hoya*?  
common
- 12 60 *Ficus*  
very common in undergrowth

- 3 m. hanging shrub.  
fruit immature
- 2 m. shrub; corollas  
white, 4-angled, fragrant.
- 2 m.
- 30 m erect shrub ~~2~~<sup>3</sup> m. tall.
- 20-25 m  
↓  
very stiff, tends to be  
raised from surface of bark.  
liana, mostly sterile;  
fruit immature.
- tough liana; fruit  
immature,  
sterile vine.
- scrambling, semiscandent  
shrub, branchlets  
tend to point backward;  
buds white.
- lactiferous liana; sterile.
- sterile shrub 2-3 m. tall,  
leaves glossy.



Labels typed  
54

1965 Caroline Is.

47661 *Nepenthes mirabilis*  
locally common

9 62 *Psychotria*  
common

Orubaiyu Island, "Sev  
left. 1 - ~~sav~~, innermost  
small beach, on larger island  
~~on~~ in forest on beach  
of fine white sand

6 63 *Terminalia samoensis* Rech.  
occasional

1 64 *Cycas circinalis* L.  
occasional seeds and  
seedlings on beach, larger  
plant not seen.

6 66 *Pongamia pinnata*  
several trees

8 65 *Cordia subcordata* Lam.  
one large tree

same - on cliffs

8 67 *Glochidion*  
one tree seen

Palau

55

extensive woody liana,  
pitchers on some leaves,  
flowers with rather  
naughty odor, green with  
yellow stigma at first, flower  
soon turning reddish green.

shrub 1-2 m. tall,  
bark smooth, dark  
chocolate brown, buds white,  
fruit immature.

entire Islands' Nature Reserve,

1 m

shrub 2 m. tall, rather  
sprawling; mature  
fruit red, eaten avidly  
by Palauans, but rather  
bitterish, astringently sweet.

tree about 5 m. tall,  
spreading, drooping,  
flowers purplish.  
very spreading tree,  
corolla brilliant deep orange.

2-4 m

small tree 6 m. tall, leaves areolate;  
fruits green.



- 47668 *Arthropteris?*  
3 abundant  
3 69 *Psychotria?*  
rare  
1 70 *Psilotum nudum* (L.) Beauv.  
rare  
2 71 *Asplenium*  
common  
3 72 *Lastrea*  
occasional

Sept. 1 - ~~small~~ island  
just south of <sup>Butotogibo I.</sup> ~~coast~~  
~~end of middle group~~ of  
Urukthapel Island

- 11 73 *Phyllanthus rupestris*  
common, hanging  
from cliffs just above sea.

sterile shrub

2m.

branch systems conspicu-  
ously articulate to main  
stem 1-2 m. long, up to  
2 cm thick, staminate  
flowers yellow; fruit  
green.



Airai

Desmodium

<sup>pounded</sup> <sup>obulabulu</sup>  
 lvs used in tattooing  
 to heal sores. juice used.

Dianella ens.

<sup>kobesos</sup>  
 used with <sup>lukela beap</sup> <sup>Ryegrass</sup> <sup>cern.</sup>  
 Hedysotis <sup>omudlach</sup>  
 in water to bathe  
 mother after childbirth  
 (ceremonial)

Cassytha <sup>te lel anl</sup>  
 (belt) (rain)

used to cure venereal  
 disease in men & women  
 pounded, squeezed & drunk.

Dracaena <sup>oradake</sup>  
 used to regulate flow of  
 blood after childbirth  
 rubbed in water, drink  
 juice

Phyllanthus <sup>ludul a rubak</sup>  
 used in place of loincloth  
 when going fishing.

~~Laportea~~  
 Manilkara <sup>nduidh</sup>

Buchanania -

vigens used to eat.

<sup>pekai</sup>  
 midarabakai

Freycinetia ienwel

Psidium <sup>arabelu</sup>  
 (seaweed found on land)

Sphenomeris alu

Lindsaea <sup>amarsu</sup>  
 Polypodium

Flagellaria <sup>bangamel</sup>  
 stems used as spear in war

(Rub.) <sup>midarabakai</sup>

Boerlagiodendron kesiamel

Medinilla demedemekur

Melastoma <sup>mataukui</sup>  
 medicine for burns



*Acalypha* - nap

ginger (giant) tuwarakiid  
(banana for staling?)

*Campnospermum* kekeleam  
(bird food)

*Rhus* ~~ses~~ ses  
leaves used as <sup>black and dark blue</sup> dye for  
pandanus leave  
boiled

mrinda kesenga ngel  
same use as ngel

*Timonius* blau  
wood used for  
oars.

*Lentinus tuber. regius* -  
aro

*Psychotria* ~~to~~  
demerimagur

orchid ural angoyas  
(tongue of green snake)

*Fagraea* ksid  
flowers for ornament

(for treatment of venereal disease)

*Pandanus tectorius*  
male inflorescences  
very common on savanna.

The forest in the  
Babeldaob uplands, at  
least that part along the  
road from Airai to Nekhen,  
is rather scrubby; the  
large trees, if there were  
any, have been logged  
out in Japanese time.

There are a few large  
ones, probably mostly  
*Parinari*. The seeds  
of *P. glaberrimum* on the  
ground (abundant), all seem  
somewhat small, compared  
with Sonape, and perhaps  
even with elsewhere on Palau.  
*Manilkara* seems to be  
the most common tree. All  
large trunks show transverse  
scars from tapping.

Epiphytes common but  
not in great abundance,  
mostly on trunks. *Schizaea*  
is the most common terrestrial  
fern, very deeply rooted.  
*Lentinus tuber-regius* on  
ground, looking like stone.

Composition mixed, but  
*Manilkara*, *Campnospermum*  
+ *Parinari* the most common trees



Savula  
typical

1965 Caroline Is.

Sept. 2 -

south central Babeldash Island  
s.w. of Mt. Yekigaro  
in rather scrubby  
forest on deeply weathered  
volcanic rock.

47674

*Fagraea ksid*  
occasional

2

75

*Polypodium*

occasional, epiphytic

1

76

*Hymenophyllum*

occasional, epiphytic

3

77

*Boerlagiodendron*

occasional in undergrowth

6

78

*Eurya nitida*

occasional

5

79

*Evodia*

uncommon in undergrowth

1

80

*Tacca palmata*

uncommon

7

81

*Timonius*

occasional

4

82

(orch.)

locally common, epiphytic

15

83

*Marilkara udoides* Kaneh.

most common tree

130 m

↓

~~fl~~ corolla white, creamy,  
no differentiation into  
tube and throat; fruit  
orange, oblong, nodding  
"ksid" flowers used as  
hair ornaments.

slender tree 5 m. tall,

small tree, flowers white

shrub 2 m. tall, flowers  
white.

ripe fruit scarlet.

small tree, flowers  
white, fruit green. ~~fls~~  
~~used for~~

flowers yellow with dull  
orange ~~color~~ reflexed lip.

tree 10 m. tall, lactiferous,  
fruit orange when ripe;  
"nduidh"



Calbe  
64

1965 Caroline Is.

47684 *Cyrtandra palauensis*?

1 one plant seen

" 85 *Psychotria*  
common

1 86 *Ixora casei* Hance  
occasional

8 87 *Trema*  
common

5 88 *Psychotria*  
occasional

3 89 *Campnospermum brevifoliatum*  
common

10 90 *Timonius*  
occasional

~~91 *Alpinia*~~

8 91 *Morinda pedunculata* Val.  
occasional

2 92 *Alpinia*  
locally common

~~93 *Medinilla*~~

11 93 *Medinilla*?  
locally common

Palau

65

creepers, clinging close to  
tree trunks; sterile.

shrub 2-3 m. tall, flowers  
tubular, white. ~~fruit~~  
~~becoming reddish.~~

shrub; flowers scarlet.

shrub 1 m. tall, leaf  
veins reddish.

shrub; fruit becoming  
reddish, fleshy, ellipsoidal.

"nidarabakai"

large tree, fruit immature.

"kelelearn" (fr. bird food).

slender tree 10 m. tall,  
flowers white. "blau"

word used for ears.

flowers dull bluish

leafy stems to 6 m. tall,  
inflorescence pendent,  
flowers red with white tube.

"tuwarakiid" (fr. starling's banana).

slender tree 6 m. tall,  
fruit immature

"demedemekur"



Labels  
typedSept. 2 - Aiarai, <sup>near</sup> west end  
of airstrip  
on *Gleichenia* savanna

47694

*Dracaena*

occasional in thickets

1 95

*Desmodium*

✱

1 96

*Spathoglottis*

rare

6 97

*Hedyotis*

common

✱

2 98

*Manilkara udrids* Karst.

occasional

4 99

*Phyllanthus*

occasional

47700

*Buchanania*

7

occasional

60 m

↓

"radaki" used to regulate  
flow of blood when  
irregular after childbirth.  
flowers purple.

"okulabulu" pounded  
leaves used to heal  
sores after tattooing.  
flowers white.

erect shrub, 0.7 m. tall,  
inflorescence bluish  
to black, corolla lavender.  
"omudlach" ingredient  
in water used for  
ceremonial bath for  
mothers after childbirth.  
sterile lactiferous  
shrub, 0.8 m. tall.

"udridh"

shrub 0.8 m. tall

"dudula mbak" used in  
place of loin cloth when  
going fishing.

shrub 1 m. tall; flowers  
bronz; fruit immature  
"pigeons eat fruit"



Labels  
typed

Sept. 2 - same as 47674-47693

- 47701 Polypodium  
 7 common epiphyte  
 3 02 Schizaea dichotoma  
 common on forest floor  
 4 03 Humata  
 rare ~~epiphyte~~ on log  
 1 04 Bulbophyllum  
 epiphyte on tree trunk  
 1 05 Taeniophyllum  
 epiphyte on tree trunk  
 1 06 Asplenium nidus  
 occasional epiphyte  
 1 07 Sphenomeris  
 occasional  
 1 08 Belvisia spicata  
 epiphytic  
 1 09 Hymenophyllum  
 epiphytic  
 1 10 Psilotum nudum (L.) Beauv.  
 rare epiphyte  
 3 11 Asplenium laserpitifolium  
 occasional epiphyte  
 1 12 Lindsaya  
 occasional, terrestrial  
 4 13 Pandanus  
 occasional

130 m.

creeping

extensively creeping,  
one fruit, only, seen.

forming a rosette.

shrub 3 m. tall,  
ripe fruit orange.



1965 Caroline Is. - Marianas

Sept. 3 - Yap - from air.  
Areas of *Phragmites* back  
of mangrove on east coast  
south of airport.

*Pandanus tectorius* male  
inflorescences conspicuous  
from air.

Large erosion scars on  
Tornil-Gagit near Loan Station  
toward Tornil and Tageren  
Canal.

Much of reef flat  
away from reef edge  
seems to be sand bottom.  
No apparent algal ridge  
on parts visible from  
plane.

Sept. 6 Guam -  
Many royal palms  
in school campus  
between Barrigada  
and Mangilao, on  
cross-island road.  
They seem to be true  
royals, drooping leaves.

Marianas

Sept. 6 - Guam - Taipei  
by air - rt. sid DC-4.  
Weather partly cloudy.  
5000' cruising alt. 1 p.m.

NAS Agaña west  
side of north end of  
strip - abundant  
clumps of what seems  
from a distance to be  
*Saccharum spontaneum*  
on graded slopes.

Small wooded coastal  
area at Hilaam (?) seems  
easily accessible from  
road down to beach  
just n. of housing  
area (NCC Beach?).

Strip of forest about  
300 m. or more wide  
extending east from  
light at Ritidian along  
top of cliffs.

Rota - As Malote area  
looks badly eroded from  
a distance.

Forest on slopes w. of  
as Malote still looks  
good. Also that on s.w.  
peninsula.

West slope seems to have



deteriorated some but steeper slopes generally still seem well-wooded. Terraces are a patchwork of clearing and wood. Good forest on lowest terrace around most of periphery, but very narrow at north-east corner, where there is an extensive clear area on west to lowest terrace.

Aguiguan - old cane fields on top light green except the northern-most, which seems more open bare. Wind-breaks still very clear. West slopes wooded but upper parts show some bare rock or eroded soil.

Tinian - still has generally open appearance but with patches of thicket, long strip of woody vegetation. The north and west parts largely covered by patches of scrub, but with some bright green grassy area. Probably much

of what looks open from a distance is *Leucaena*. In this case, fully 30% of area is *Leucaena*, steeper escarpments are forest only bright green patches, especially just back of shore, are grassy. Wind-breaks have spread and become diffuse.

Saipan - south end *Leucaena* with emergent *Acacia confusa* and *Casuarina*. North of a strip *Delonix* in flower.

Marpi Point - the entire terrace below Marpi Cliffs, formerly in sugar cane, then partly air field, is a vast expanse of *Leucaena*.  
Photos b+w + Kod. panoramas.

Other cane fields on upland slopes, largely grown up to *Leucaena*. One patch of cane still remains ~~at~~ south of Marpi.  
Photos b+w + Kod!

On cliffs and near edges of cliffs some native vegetation remains.



Sept. 4 Saipan  
Plants seen.

*Cycas revoluta*  
*Bougainvillea glabra*  
*Cravearia excelsa*  
*Vanda miss Joaquim*  
*Chloris inflata*  
*Stachytarpheta jamaicensis*  
*Conyza canadensis*  
*Tricholaena rosea*  
*Cyrtosperma chamissonii*  
*Colosaria esculenta*  
*Musa sapientum*  
*Polyscias fruticosa*  
*Plumeria rubra*  
*Cocos nucifera*  
*Veitchia merillii*  
*Roystonia cf. regia*  
*Euphorbia spathulata*  
*Sambucus*  
 Ixore (white)

The small mangrove swamp at Tanapag is still just about as in 1946.

The roads are so completely lined with *Leucaena* that one can, in most places, see nothing.

In the Tanapag area, both north and south, are marshy areas, some dominated by *Phragmites*, some by *Ipomoea aquatica*.

Near Lake Lusup are parts of the canal filled with *Eichhornia crassipes*.

Lake Lusup has still much open water, some *Scirpus*, but the swamp areas are mostly now under cultivation.

The sword grass ridge south of Tagbochan is still in sword grass.

Saw 2 coots, one bittern, and one white heron on Lake Lusup. Taggart tells of a 16 foot crocodile killed at Tanapag. Says some may still be in Lake Lusup. Local Carolinian says no, only "Iguana". Lake full of *Tilapia*.



76

1965 Marianas Is.

Labels  
typed

47714

4

Sept. 6 - just north of  
Tanapag*Desmanthus virgatus*  
very common along road  
in edges of *Leucaena* thicketsSept. 6 - Marpi Point,  
on lower terrace

on roadside in limestone soil

3

15

*Chloris*

common

1

16

*Eragrostis*

rare

1

17

*Eupatorium odoratum* L.

common

1

18

*Acalypha indica*

common

same - on limestone just  
back of cliff edge.

1

19

*Phyllanthus*

abundant in large patches

2

20

*Heliotropium <sup>procumbens</sup> ~~rostratum~~* var. *dep.*

common locally

3

21

*Sporobolus ~~virginicus~~*

abundant in large stands

Saipan

77

3 m

suffrutescent herb 1 m.  
tall.

15 m

culms decumbent at  
base, rooting at nodes, ascending.branching herb with  
strong resinous odor, <sup>all seen</sup> sterile.  
erect.

depressed shrub.

flowers white.

decumbent to ascending



1965

T.T.

Caleb Udun  
Asst. Attorney General  
T.T. will be  
Legislative Counsel for  
Congress of Micronesia  
after October 1.

is very conservation  
conscious, museum  
conscious.

Manuel Sproat will  
offer full cooperation in  
any development of  
Palau lab.

The Micronesians should  
be given some role in any  
lab set up, so they will have  
some proprietary feeling.

Both Udun and Sproat will  
back Cheatham policy  
statement.

De Young seems favorably  
disposed to cooperation, but  
has reservation that T.T. can't  
always furnish transportation  
+ housing for visitors.  
Also that there is a half  
million dollar limit on  
amount of aid from other  
Govt. agencies without

T.T.

it being charged to  
T.T. budget. No obstacle  
to cooperative arrangement  
bet. T.T., U.H., + Smi.

Sproat is much in  
favor of setting aside  
of scenic and scientific  
reserves, as well as  
of development of a  
research program.  
Also will give backing  
to a sound conservation  
program in T.T. if  
we can come up with  
one.

Clarence Takeuchi is  
temporarily charged with  
developing a "national  
park" program.

A couple of National Park  
Service representatives  
on a visit to Guam got  
up to Saipan and were  
enthusiastic about even  
that.

System of Scenic  
Reserves, Scientific Reserves,  
and Historical and  
Archaeological Monuments  
should be built into  
policy statement. Conservation  
Dept. should be given full status.



Adequate system of records + information should be set up, probably centered in Palau Lab. Museum activity should be tied in.

Paul Winsor

Asst. Comm. for Resources Development  
Climate for research and  
for cooperation is very good  
at present.

~~From~~ Bob McKnight (now  
U. of Wisconsin) has proposed  
a center for research of  
Community Development  
on Rongerik I., Truk,  
for trainees and available  
to scientific community.  
Thems in Community  
Development files, Laipam.

Proposed to Mr. J. E. Hawkins  
that steps should be taken  
to (1) prepare a preliminary  
list of sites of scenic,  
historical, archeological,  
and scientific interest  
by utilizing available  
local knowledge and  
that of past scientific  
visitors. (2) ask Interior  
for a team with proper

competence to come out and  
evaluate these, ~~and~~ take steps  
and classify them, (3)  
take steps to get proper  
legislative basis for  
preservation of these, and  
(4) To get the important  
ones set aside and protected.

Offered to help with a  
list of places I know and  
a list of scientific  
visitors who have  
been here.

Hawkins is much in  
sympathy with this, and  
realizes that if a tourist  
business is ever to be  
developed here, care will  
have to be taken to preserve  
what tourists will want  
to look at.

Hawkins is Asst. Comm. for  
Community Development.



As Eo -

*Pteris vittata* abundant

*Muntingia*

etc

st

Exp. hta.

*Whimosa invisa*

*Muntingia* <sup>very abundant</sup>  
on land cleared

*Melia azederach* <sup>on station.</sup>  
not flowering

Sept. 7 Trip by air - Saipan -  
Guam.

South end of Saipan -  
solid *Leucaena* where  
not concrete, with scattered  
*Casuarina* and *Delonix*  
emergent through it.

Trinian - on east side  
and south some relatively  
open areas of grass - otherwise  
almost solid *Leucaena*. The  
terrace on east side just back  
of sea cliffs still seems to  
be largely grass covered.

Carolina Ridge seems  
to be a patchwork of grass  
and forest with some  
*Leucaena*.

Agiguan - from east the  
steep slopes and cliffs  
are thinly wooded and  
the rock shows through.  
The top is largely  
light green with dark  
wind-breaks.



Sept. 17 - Volcano Road,  
Hilo - Kilauea.

The pink *Polygonum* has become very abundant along the road for several miles, up to about mile 26.

Sept. 19 - Kilauea area and down to 29 miles - *Holcus lanatus* has become generally abundant on roadside and in open or semi-open places. Conspicuous in Steaming Flats. J.O. Wentworth says this has happened in the last couple of years.

*Paspalum unvillei* is also now very common along roads and in disturbed places.

Dead *Metrosideros* trees are more conspicuous - even in the Kilauea Iki area.

End of board-walk near Kilauea Iki parking area.

*Buddleia asiatica* is the dominant shrub on spatter beds and around edges of cinder beds along edge of forest.

*Holcus* + *Pasp. unvillei* also abundant.

Sept. 19 Puhimau Crater

tagged *Lehua* trees

#1 Young growth abundant and apparently healthy. Many dead small twigs and branches back to about 5 or 6 order ramification. one large lower branch dead. Many young fruits.

#2 Main leader dead but vigorous lateral short branches abundant. Dark green.

#3 Almost dead - a few small twigs with tufts of leaves. 3 vigorous small branches on ~~one~~ one main trunk are green but even these show dead twigs.

#4 Leaves rather few and sparse but still well distributed, but these leaves are ~~mostly~~ brown and all or almost all dead.

#5 Tag on ground under tree - probably the one - a tall rather healthy-looking tree, dark green, dense, but with some dead smaller branches.



#6 Still rather densely leafy, but with galls abundant, some new young growth. Considerable number of dead twigs and small branches.

#7 Top dead many very vigorous twigs in lower half, but all principal branches dead at tips. Young growth somewhat pale, reddish green.

#8 Still densely leafy, but leaves show some tendency to browning, young growth reddish. Some dead twigs and small branches.

#9 dead.

#10 Main stem fairly healthy looking, many buds, a few flowers just past; leaves not a very good green, somewhat dull, yellowish. Largest basal sprout dead, next largest almost dead.

Kipuka just s. of  
Caldera rim near Halemaunau,  
almost closed scrub,  
some grassy ~~small~~ openings,  
several small trees

o Metrosideros collina T

a Hedyphelia tameiameia

c Dodonaea viscosa

o lc Laggeria cyathoides

n Vaccinium reticulatum

l Aphenomeris

c Holcus lanatus

c Desmodium uncinatum

edges n Conyza canadensis v. pusilla

l Melinis minutiflora

n Cyperus hawaiiensis

c Cyperus polystachyos

edges c Bulbostylis capillaris

o Sporobolus africanus

o Paspalum stricatum

la Cynodon dactylon?

la Cyperus brevifolius

l Eupatorium riparium

edges n Pinaria canadensis

n Festuca bromoides

n Gnaphalium purpureum

n Conyza bonariensis

l Hypochaeris radicata

n Agrostis avenacea

l Eragrostis



Sept. 20 - Kilauea Volcano,  
~~near~~ Crater Rim Rd. near  
 residence area

in disturbed *Metrosideros* forest

47722 *Lonicera japonica* Thunb.

3 rare, persisting from  
 cultivation

9 23 *Elaeagnus umbellata* Thunb.

rare, persisting from  
 cultivation, showing a slight  
 tendency to spread, probably  
 by root sprouts.

Sept. 20 - Kilauea Volcano,  
 northwest rim of Caldera  
 in garden in ~~trans~~  
 clearing in low forest

3 24 *Euphea hyssopifolia* HBK.  
 planted

2 25 *Oxalis corniculata*  
 weed in orchid boxes

1 26 *Veronica serpyllifolia*  
 weed in orchid boxes

4 27 *Cyperus*  
 planted in shaded place

Sept. 20 - Kilauea Volcano,  
 Kilauea Iki

5 28 *Paspalum unvillei*  
 very common on fresh climber section

1220m

4000'

twining woody vine,  
 flowers fragrant, white,  
 turning deep yellow.

shrub or small, very  
 bushy tree, 5-6 m. tall,  
 with drooping branches,  
 no tendency toward reflexed  
 branchlets; flowers white,  
 slightly fragrant; no  
 sign of setting fruit.

1235m

4050'

spreading dwarf shrub,  
 flowers dull pink.  
 stems red; petals yellow.

prostrate; flowers light  
 blue.  
 used for flower arrangements

1220m

4000'

erect, to 2 m. tall, panicle  
 drooping somewhat.



Salvage  
typical

1965 Hawaiian Is.

Sept. 20 - Kilauea Volcano,  
just s.w. of caldera rim,  
near Halemauumanin island of scrubby  
vegetation in ash beds

47729

*Eragrostis*

rare, sheltered by bush

1 30

*Cyperus*

rare in open spot

2 31

*Cynodon dactylon* (L.) Pers.Sept. 20 Kilauea Volcano,  
caldera floor near Halemauuman  
in fumarole field

5 32

*Arundina bambusifolia* Lindl.  
common in cooler areas

2 33

*Fimbristylis dichotoma* var.

common on warm ground

2 34

(scrub.) *Lindernia crustacea* (L.) F. Muell.

common on warm ground

Sept. 20 - Kilauea Volcano,  
~~Park~~ near Park Headquarters  
in densely grassy waste ground

3 35

*Holcus lanatus* L.

very common

1 36

*Paspalum*  
common

1205 m

3950'

caespitose, mostly dry and  
shattered.

3950'

erect, stiff <sup>dulvous bases in clumps,</sup> stems, to  
1 m. or more tall, flowers  
white with bright  
purple lip, palates yellow.  
— stems prostrate to  
— somewhat ascending.  
reddish depressed plant,  
flowers purple.

1220 m

4000'

This grass, present for a  
long time, has suddenly, in  
the past 2 years, become  
generally abundant.  
— erect culms with drooping  
panicle. This grass has  
become very common in the  
last 2 years.



Labels  
92 typed 1965 Hawaiian Is.

47737 *Veronica*  
9 well established

8 38 *Heterocentron subtriplex* (L. & O.) A. P. x Bauchi  
common

8 39 *Heterocentron* " f. *roseum* (P. & Bauchi)  
abundant Deg. Deg. &  
green w.

1 40 *Cyperus*  
rare, in deep grass

Sept. 21 - Volcano Road  
just above Kurtistown

1 41 (melast.) *Tibouchina multiflora*  
planted

~~Hawaii~~ Hawaii Volcanoes Nat. Park 93

large clump about 1-1.5 m.  
tall; flowers reddish purple.  
sparingly branched  
shrub or suffrutescent herb, to 0.7 m. tall  
flowers white with yellow  
stamens, panicle dull reddish.  
sparingly branched  
shrub or suffrutescent herb,  
to 1 m. tall, flowers lavender  
pink, with pink stamens,  
panicle bright red.  
culm solitary, erect;  
spikelets bronze green.

200 m

650'

shrub 0.8 m. tall,  
flowers deep purple.



94

1965

Virginia

exel. winter

47742

2

Oct. 2 - Annandale

*Paspalum ciliatifolium* Michx.open grassy slope,  
probably mowed.

100m

Fairfax Co.

95

spreading tuft



1965 Brazil

Oct. 17 - left Rio for Buenos Aires, Varig Boeing 707, it took 9:00 a.m.

Many small dome-shaped granite islands outside Rio Harbor. Mostly seem rather undisturbed - variously vegetated. Would repay a comparative study, emphasizing area ~~size~~ <sup>vs.</sup> extent of flora. Some might present difficulty in landing.

Extensive off-shore bars extending southward, enclosing lagoons. Interrupted where mountains reach sea. Long extents of these bars seem relatively undisturbed.

Rocky islands of various sizes become abundant southward.

Visibility becomes nil for a time, then nothing but open sea.

At 10:20 a very irregular coast line with wide beaches. Coast seems mainly of islands. The larger of these are mountainous, with forest and some clearing. Complicated and extensive

apartados  
apartados  
da Serra  
Cachoeira

series of beach ridges, and mountains on mainland. Much clearing. Some smoke from fires. Plane is at such an altitude that it is hard to make out much detail except that clearing seems to increase inland. Many of clearings seem to be absolutely bare soil. This land, however, obviously was generally forested.

At about 12:32 the course is parallel to a spectacular escarpment which seems to bound a very extensive level plateau that is primarily grassland, extending to limits of visibility to right. Crossed the escarpment.

Then (poor visibility for a time. The grassland seems dry.

Then for a long distance vast ~~dry~~ savannas with gallery forest along <sup>longer</sup> streams. After a while the drainage goes more westward.

Many small square blocks of forest scattered in the savanna.

Then no visibility, much turbulence.



Oct. 17 - Buenos Aires

Principal street tree is  
Platanus - London Plane?

also Melia azadirach

Acer negundo

Ailanthus altissima!

~~Styracis japonica?~~

(a deciduous tree scarcely  
leafing out is common  
along the wide prado  
in the center of town.

a few Echinus molle  
and a small-leaved  
gray-green tree.

The country up. river  
from Buenos Aires from  
the air is a vivid green,  
all cultivated. Apparently  
not an acre of natural  
vegetation, though there  
is some pasture.

along the highway  
from the Ezeiza Airport  
to B.A. is a park - grass  
with groups of planted  
trees of various kinds,  
mostly evergreens.

Oct. 17 Buenos Aires - Mar del Plata  
in Viscount (st. side.)

Outside city to south,  
land is vivid green. Many  
hedge enclosures, both  
around houses and  
what are obviously pastures.  
Visibility poor.

Oct. 21 - beach at Mar del Plata.

Absolutely nothing  
growing on beach. Atriplex sp.  
(a gray shrub) and Myoporum  
cf. tenuifolium (glandular lvs.)  
are principal shrubs  
planted as ornaments  
on slopes. Many common  
flowers - Calendula, Matthiola,  
etc. Weeds are mostly  
familiar, but one liliaceous  
herb with white fls. very  
common. Senecio very  
common, and a Cheiranthus  
or Erysimum. Agropyron a  
Brachypodium common. also  
Senecio. Cotula australis a  
Discordea



Oct 22 Outside Mar del Plata or in suburbs  
*Eucalyptus* cf. *globulus*  
 & *Myoporum*, ~~are~~  
 also *Cupressus*, are  
 commonest planted  
 trees. *Populus* sp.  
*Salix* sp. *Tamarix* sp.  
 common. *Acacia* sp. (phyll.)  
*Pinus* sp. *Populus*, *alba*

Outside, trees are  
 less common, more shrubby,  
 land mostly pasture.  
 A gray thistle, like an  
*artichoke*, a very common  
 weed. ~~Robinia~~ *Robinia*  
*acacia*

*asilvestrado* = escaped  
 from cult.

Alberto Loriani & page  
 on *Atriplex*.

Trees at Rancho El Casal

*Photinia serratifolia*  
*Cupressus sempervirens* var. *stricta*  
*Acer platanoides*  
*Platanus X acrofolia*  
*Acacia melanocylon*  
*Eucalyptus globulus*  
*G. camaldulensis*  
*Juglans regia*

*Cedrus deodara*  
*Populus caroliniana*  
*Citrus limon*  
*Acacia dealbata*  
*Fraxinus* sp.  
*Abies* sp.  
*Thuja* sp.  
*Prunus* (Japanese cherry)  
*Picea ~~mariana~~ engelmannii*

Oct 22 - trip from Mar del Plata  
 to Buenos Aires, Vincent, left side.  
 7 p.m.

Vicinity of Mar del Plata  
 very green, much planting  
 of tree in patches and  
 wind breaks.

Northward for a considerable  
 distance small ponds are  
 in great abundance.  
 Meandering, discontinuous  
 water-courses are common,  
 mostly running across our  
 course.

To the right the coast  
 is not far away. A barrier  
 beach ridge and coastal  
 lagoons.

The ponds become larger  
 and the proportion of ground  
 covered by water greater  
 northward at about half  
 way to B.A. Become larger and  
 fewer northward.



labels  
writtenOct. 23 - San Isidro, suburb of  
Buenos Aires, in garden  
of the Darwinian  
planted

47743

Maytenus

2

2

44

Terminalia australis

1

45

Bromus arquensis

growing in shade

1

46

Myriophyllum brasiliense  
in outdoor tank

4

47

Byttneria scabra

Oct. 24 Punta Lara, north of  
La Plata, Riode La Plata  
in ~~relict~~ relict riverine forest

1

48

Cordia

common in undergrowth

2

49

Schinus longifolia

occasional in edges of

1

50

Cestrum

occasional in edges

1

51

(rub.)

occasional in undergrowth

2

52

Allophylus edulis

occasional in understory

2

53

Bowlesia incana

occasional in edges

3

54

Salix chilensis

occasional in edges

large shrub

large shrub,  
flowers green.  
culms almost erect.

pistillate flowers

shrub 1.5 m. tall  
flowers dull purplish.shrub 2 m. tall, flowers  
white.spiny shrub 2.5 m. tall,  
flowers greenish white.shrub 1 m. tall, malodorous  
when broken; flowers greenish  
yellow.

shrub 0.5 m. tall; sterile.

small tree 5 m. tall, flowers  
whitish. Fruit said to be eaten.  
more or less prostrate herb.leaning tree 3 m. tall, with  
many flowering sprouts  
along trunk.



## Punta Lara

Remains of native  
riverine forest - southern  
limit of subtropical flora

*Terminalia australis*  
*Blepharocalyx*  
*Pouteria salicifolia*  
*Lebastiana brasiliensis*  
\* *Ligustrum lucidum*  
*Ocotea acutifolia*  
*Citharexylum*  
*Allophylus edulis*  
*Salix chilensis*  
*Myrsine* (Rapanos)

epiphytic  
*Tillandsia*  
*Polypodium*

*Poxantha unguis-cati*  
*Cardiospermum* sp.  
*Bignonia* purple fl.  
*Metastelma*  
*Solanum*

*Pavonia repens*  
*Cordia*  
*Sambucus australis*  
\* *Rubus* sp.

## Melica

*Bromus unguensis*  
*Bromus unioloides*  
*Eragrostis pandanifolia*  
*Oxalis articulata*  
~~*Tradescantia*~~  
*Hydrocotyle leucocephala*  
*Polypodium connata*  
*Senecio* sp.  
*Cestrum*  
*Bowlesia incana*

photos

Large area of marsh  
with *Scirpus giganteus*  
and scattered *Erythrina*  
trees, very gnarled.  
*E. crista-galli*. Pos. of *Scirpus* dead  
distally.

Thickets with *Celtis*  
*spinosus*, *Clematis* sp.  
*Lonicera japonica*  
*Quadrantaria*, *Achimenes*  
*longifolia*

Except for small areas of  
wood & thicket, and larger  
areas of marsh, the area  
back of the sea wall is  
mostly planted to *Salix babylonica*.  
The water in the small



estuaries is filthy with floating oil and grease.

In the open flat pastures *Cynara cardunculus* is an almost universal weed, also on roadsides.

Whitish mares are *Senecio benariensis*.

Where there are thickets, *Lonicera japonica* is abundantly climbing over them, flowering heavily.

*Eichhornia crassipes* in margins of river.

A very conspicuous plant is apparently *Conium maculatum* in low spots.

*Zantedeschia aethiopica* (white) is abundantly naturalized in marshes.

1965

Virginia

Nov. 7 - Sleepy Hollow

Condition of trees

*Liriodendron* - leaves practically all fallen, a few trees still retain <sup>some leaves</sup>

*Liquidambar* - still retains most or many leaves, these greenish-yellow, yellowish red, or purplish red.

*Salix babylonica* - still green.

*Quercus palustris* - brown leaves.

*Prunus serotina* - lvs. yellowish-reddish-green, half fallen.

*Acer rubrum* - lvs. yellow.



1965

Virginia

Nov. 7 - Sleepy Hollow

Condition of trees

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all fallen. a few trees still retain <sup>some leaves</sup>

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*Quercus palustris* - brown brown.

*Prunus serotina* - lvs  
yellowish-reddish-green,  
half fallen.

*Acer rubrum* - lvs. yellow.



1965 Virginia

Nov. 7 - Steamboat Run,  
Potomac River ~~at~~ near  
Shepardstown.

Second-growth deciduous  
woods, very local *Pinus*  
*virginiana*, on land  
just above river bluffs.

*Ostrya virginica*  
*Carya* spp. cordiformis

*Cornus florida*

*Liriodendron tulipifera*

*Quercus rubra*

*Platanus occidentalis*

*Acer rubrum*

*Quercus prinus*

*Fraxinus americana*

*Acer nigrum*

*Quercus velutina*

*Fagus grandifolia*

*Prunus avium*

*Quercus* cf. *falcata*

*Sassafras albidum*

*Viburnum acerifolium*

*Rosa carolina*

*Asimonia triloba*  
common in steep valley and above river bank.

\* *Rosa multiflora*

*Rubus* cf. *argutus*

\* *Lonicera japonica*  
several large patches.

*Smilax* cf. *hispida*

*Rubus phoenicolasium*  
*Allium vineale* one plant at  
top of cliff.

\* *Rumex obtusifolius*

*Saxifraga virginica* - on ledges.

*Arabis laevigata* (1)

*Carex fraseri* - occasional at  
top of cliffs.

*Asplenium platyneuron*

\* *Glechoma hederacea*

*Eupatorium rugosum*

*Asplenium dryopteris*  
locally very common

*Hepatica triloba* on limestone  
outcrops.

*Asplenium trichomanes*  
very common on cliffs and limestone outcrops.

*Pellaea atropurpurea*  
rare on limestone outcrops.

*Aster grandifolius*

*Solidago* spp.

*Dryopteris marginalis*  
occasional on limestone outcrops.



*Acer saccharinum*  
along river bank, abundant.

*Ulmus* sp.  
along river bank, rare

*Platanus occidentalis*  
just above river bank.

*Acer negundo*  
along river bank, rare.

*Filix americana*  
on steep slopes.

*Sedum* sp.  
on rock outcrops

~~*Acrostichum*~~

*Polystichum acrostichoides*  
in sloping valley.

*Artemisia*

*Atkynium filis-femina*  
on ledges.

*Asarum canadense* f. *rubellus*  
on ledges of limestone

The *Artemisia*, a species  
with filiform leaves and  
infl. branches, is abundant  
just above the gravel flats  
of the river.

*Ptelea* ?

*Lindera benzoin*

*Cerei canadensis*

*Vitis*



This area is characterized by outcrops and high cliffs of limestone. The soil is generally rather shallow.

There has been logging not too many years ago, and there are no large straight trees, though some large "wolf" trees and crooked ones. Many small to medium ones.

Gravel flats exposed by low water have an abundance of mussel shells. Possibly the mussels are eaten by mammals.

An interesting flora lives on these flats. The best season to collect it would have been Sept. - Oct.







## THIS IS STEAMBOAT RUN

### WHAT IS IT?

A 330 acre planned community on the Potomac River for those families who have the means to afford a second home in the country but do not want the care and responsibility of a large estate or farm.

### WHERE IS IT?

2½ miles upstream on the Potomac River from Shepherdstown, Jefferson County, West Virginia, home of Shepherd College and the oldest town in West Virginia. 65 miles from Washington. 12 miles from Harpers Ferry where the Capital Limited stops to pick up and discharge passengers to and from D.C. 10 miles from the commercial airport at Martinsburg, W. Va. 30 miles above the Seneca Dam Impact Area.

### WHAT DOES IT OFFER?

Three to five acre rolling wooded homesites. A few lots are as small as an acre. Most lots are about the size of a city block.

A mile of river frontage set aside as a community park.

Additional acreage set aside for use as a community horse pasture.

Options on enough additional acreage to create a fine golf course.

Carefully drawn deed restrictions and covenants to assure maximum security of investment and architectural harmony in building.

### WHAT WILL IT COST?

Prices of lots begin at \$2,500.00 Terms may be arranged with as little as 25% down. Stock purchase (in order to be eligible to buy a lot) \$100. Settlement fees approximately \$150.00.

### WHAT KIND OF A HOUSE CAN WE BUILD?

We quote from the by-laws of the Corporation..."To maintain the standards of construction in the Park, all proposed construction must conform in approximate value and cubic content to the mean level of other homes in the vicinity."

### HOW CAN WE SEE IT?

From D.C. or Maryland: Take U.S. (70 S) past Frederick, Md. U.S. 240 will merge with U.S. 40. Follow U.S. 40 about 1 mile to a Shell Gas Station where it splits in 40 and 40A. Turn left on 40A to Boonsboro, Md. Turn left at stoplight in Boonsboro onto Md. 34. Follow Md. 34 through Sharpsburg and across Potomac River. Take first sharp right turn at top of hill and follow this road to entrance of Steamboat Run. (2.7 miles from this turn). Open the gate and drive in. Please go slowly while road is under construction!

PLANNED, DEVELOPED AND FOR SALE  
BY

TIGHE WOODS, REALTOR

1830 Jefferson Pl., N.W.  
Washington, D.C.

338-6097



estuaries is filthy with floating oil and grease.

In the open flat pastures *Cynara cardunculus* is an almost universal weed, also on roadsides.

Whitish masses are *Senecio bonariensis*.

Where there are thickets, *Sonchus oleraceus* is abundantly climbing over them, flowering heavily.

*Eichhornia crassipes* in margins of rivers.

A very conspicuous plant is apparently *Conium maculatum* in low spots.

*Zantedeschia aethiopica* (white) is abundantly naturalized in marshes.



1965

Dec. 26 - Blackwater National Wildlife Refuge. south of Cambridge, Md.

An area of open fields, thickets, pine woods, ~~and~~ ponds and "creeks", marsh and swamp.

Just inside entrance in open field on right, 100-200m from road huge numbers of Canada geese were feeding, most with heads down, a few with necks stretched up - lookouts? One snow goose.

Other flocks also seen off to right in other fields.

In large ponds back of refuge headquarters on right of road to picnic grounds, many thousands of Canada geese in water and out on land. Small flocks of mallards - heads brilliant metallic green in sun, mostly males, excitedly swimming around.

When frightened enormous numbers of geese flew up, their combined call making an impressive mass of sound.

Ranger says 2 weeks ago there were 100,000 geese on refuge. 10,000 out of 11,000 are in marsh & swamp.

*Yellowthroat	SR-a	Purple Finch	WV-u
Yellow-breasted Chat	SR-c	Pine Siskin	WV-u
#Hooded Warbler	TV-u	American Goldfinch	PR-c
Canada Warbler	TV-o	Rufous-sided Towhee	SR-a
American Redstart	TV-c	Savannah Sparrow	WV-c
House Sparrow	PR-a	Grasshopper Sparrow	SR-u
Bobolink	TV-u	*Henslow's Sparrow	SR-u
Eastern Meadowlark	PR-a	*Sharp-tailed Sparrow	SR-u
Redwinged Blackbird	PR-a	Seaside Sparrow	SR-o
Orchard Oriole	SR-c	*Vesper Sparrow	SR-o
#Baltimore Oriole	TV-u	Slate-colored Junco	SV-c
*Rusty Blackbird	TV-u	Tree Sparrow	WV-o
Common Grackle	PR-a	*Chipping Sparrow	SR-c
Brown-headed Cowbird	PR-c	Field Sparrow	PR-c
Scarlet Tanager	SR-u	*White-crowned Sparrow	TV-r
Cardinal	PR-c	White-throated Sparrow	WR-a
Rose-breasted Grosbeak	TV-r	*Fox Sparrow	TV-u
Indigo Bunting	SR-u	Swamp Sparrow	WR-a
Evening Grosbeak	WV-r	Song Sparrow	PR-a

These additional 11 species are of accidental or rare occurrence and have been identified by one or more authoritative ornithologists or field observers.



# BLACKWATER

## NATIONAL WILDLIFE REFUGE

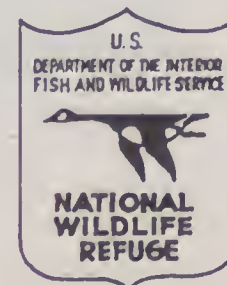


Blackwater National Wildlife Refuge, established in January 1933, is in Dorchester County on the Eastern Shore of Chesapeake Bay, about 10 miles south of Cambridge, Maryland. This refuge serves as an important resting and feeding area for migrant and wintering waterfowl in the chain of waterfowl refuges extending from Canada to the Florida Keys along the Atlantic Flyway. The area contains 11,216 acres, 10,000 acres of which are in brush and timbered swamps, marsh, and fresh water ponds. Both the Big and Little Blackwater Rivers flow through the refuge. These rivers, which provide excellent waterfowl habitat, empty into Fishing Bay and subsequently into the Chesapeake Bay.

The refuge is most interesting in the fall, winter, and spring. Waterfowl populations on the refuge have increased greatly as a result of proper land management. Blackwater Refuge had only 5,000 Canada geese during the peak concentration in 1942. During a comparable period, recently, there were 100,000 geese. A total of 150,000 ducks has been on the refuge during the peak of fall migration. The principal species are mallards, black ducks, pintails, green-winged teal, blue-winged teal, American widgeons, and wood ducks. Between 1951 and 1959, ring-necked ducks, red-heads, scaups, and canvasbacks increased in numbers annually.



**UNITED STATES DEPARTMENT OF THE INTERIOR**  
**Fish and Wildlife Service**  
**Bureau of Sport Fisheries and Wildlife**







Mallards on refuge nest box

Waterfowl that nest on the refuge include black ducks, blue-winged teal, mallards, wood ducks, and Canada geese. Other nesting species are king rails, Virginia rails, gallinules, killdeer, barn owls, and ospreys. A complete birdlist has been prepared and copies are available at refuge headquarters. Over 230 species of birds have been observed on the refuge. During one Christmas Bird Count, Blackwater listed 27 species of waterfowl--the greatest variety for any area in the entire country at that time.

The increase in the waterfowl population is mainly due to the considerable amount of development and management work which has been undertaken on

the refuge. The three main fresh-water impoundments, which have been developed for waterfowl use, are the Dieffenbach Pool Unit, Kuehnle Tract Pool, and Headquarters Pool. Another area on the west side is in the process of development, and future plans call for more areas to be developed to accommodate the large concentrations of waterfowl. These pools not only provide fresh-water resting areas, but produce quantities of natural foods through the manipulation of water levels.

Over 900 acres, mostly adjacent to the pools, are farmed to produce food for wildlife. The main crops include corn, millet, wheat, buckwheat, soybeans, barley and ladino clover. Upland game birds and animals, as well as waterfowl, are benefited.

Blackwater Refuge is a picturesque area. Its wetlands are interspersed with dark stands of loblolly pine that often rise abruptly along the borders of the level marshes. Wooded tracts at varying distances from the observer lend perspective and, where they are reflected in mirroring water, add especially to the beauty and charm of the refuge. In fall the woodlands, particularly where sweet gum and red maple grow, make a grand show of color.

Although waterfowl are the chief winter attraction, many marshbirds, shorebirds, loons, and grebes also can be observed on the refuge. Other interesting birds include the brown-headed nuthatches, which are permanent residents in the loblolly pines. On Blackwater, these birds are near the northern limit of their range.

The hunting of waterfowl is not allowed on the refuge. The area serves, however, as a reservoir from which birds fly out in seemingly unpredictable patterns for daily feeding. Consequently, hunting is benefited over a wide area.

Waterfowl habitat can be improved by muskrats when their numbers are properly controlled. This is accomplished through the creating of openings in vegetation which otherwise might be unsuitable for use by either ducks or geese. The muskrat population is maintained at a suitable level by an annual trapping program. Foxes, raccoons, opossums, and skunks are the other animals which are common on the refuge. Otters appear to be increasing on the marshes of the refuge. Whitetail deer are also plentiful. They prefer the wooded areas and many islands found on the refuge marshes for cover.

A seaplane hangar is maintained on the refuge for use by the Bureau. The seaplanes are used for enforcement and other work along this part of the Atlantic coast. Radio facilities are available for communication on this area as well as with other nearby refuges and vehicles.

Thousands of persons visit the refuge each year for viewing and photographing wildlife. Picnic facilities, with water and rest-rooms, are available near headquarters, and a visitor center is under construction. The refuge is easily reached from Baltimore, Maryland, and Washington, D. C. via U.S. 50. From Cambridge, Maryland, drive south 7 miles on State 16 to Church Creek, and left 4 miles on State 335. An entrance sign marks the northwest corner of the refuge. Headquarters are 2 miles east.

More detailed information concerning the Blackwater National Wildlife Refuge can be secured at refuge headquarters, or by writing the Refuge Manager, R.F.D. 1, Cambridge, Maryland. The telephone number is: Cambridge AC-8-2677.



Headquarters of Blackwater Refuge

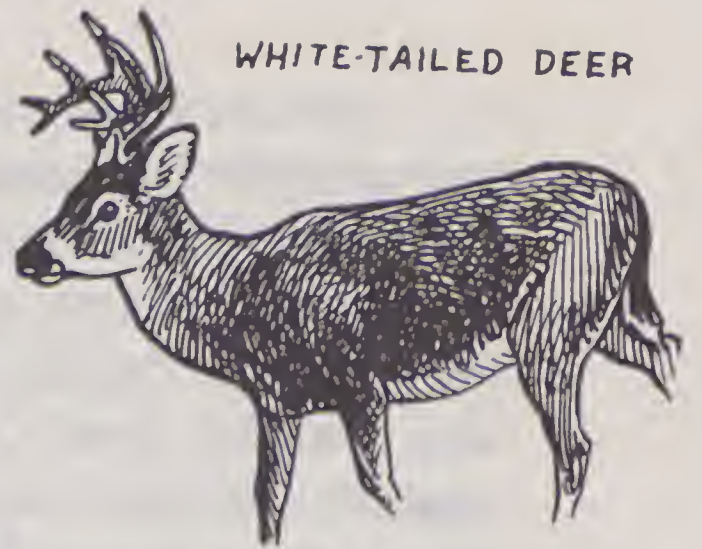


GENERAL MAP  
**BLACKWATER**  
 NATIONAL WILDLIFE REFUGE  
 DORCHESTER COUNTY  
**MARYLAND**

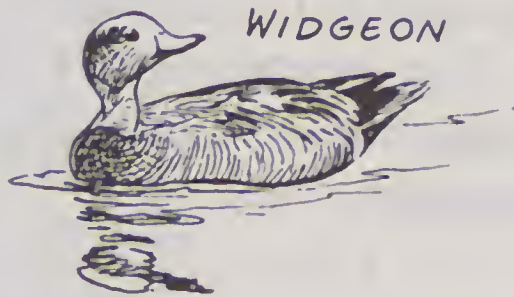
SCALE  
 0 1/4 1/2 1 2 MILES



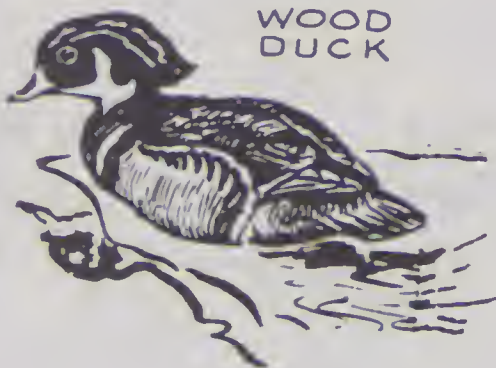
PINTAIL



WHITE-TAILED DEER



WIDGEON



WOOD DUCK



BLACK DUCK



OTTER



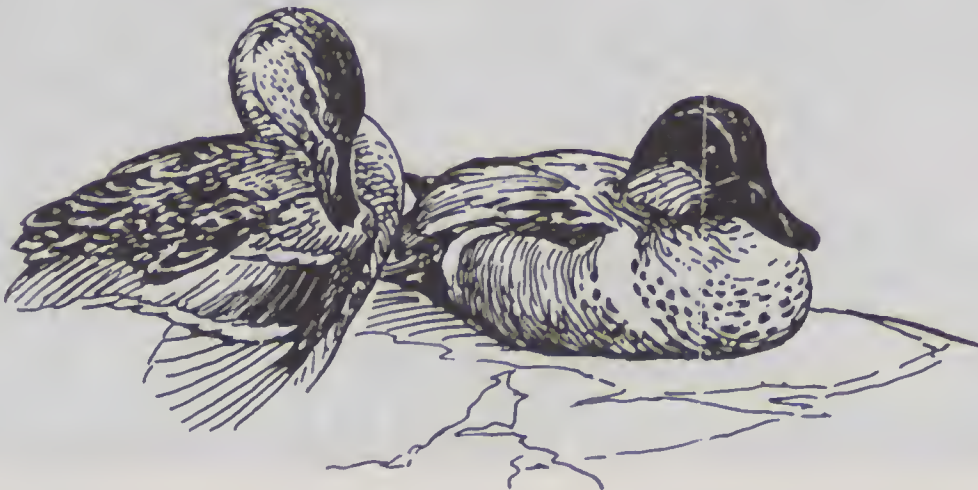
RACCOON



MALLARDS



KILLDEER

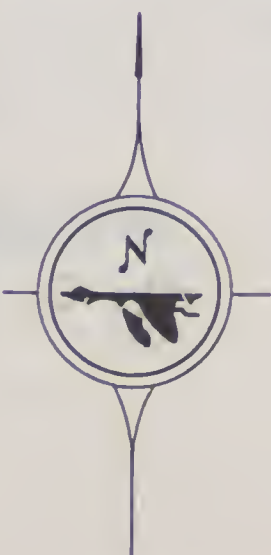


GREEN-WINGED TEAL



LOCATION MAP

SCALE  
 0 5 10 20 30 MILES

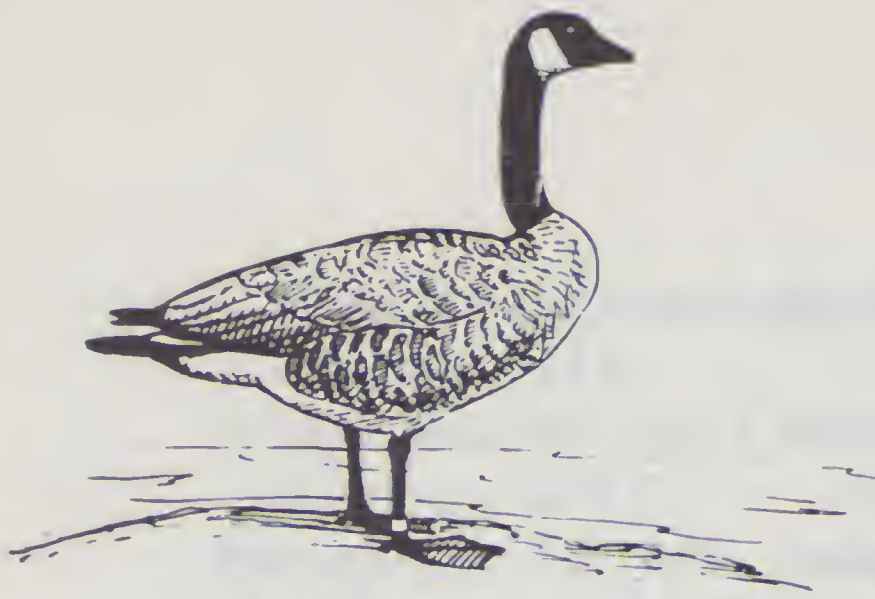


CRAPPIE

CANADA GEESE







# BIRDS OF THE BLACKWATER NATIONAL WILDLIFE REFUGE

The Blackwater National Wildlife Refuge, established in January 1933, is administered by the Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Department of the Interior. It serves as an important resting and feeding area for migrant waterfowl in the chain of waterfowl refuges along the Atlantic Flyway extending from Canada to the Gulf of Mexico. Blackwater Refuge is located on the Eastern Shore of Chesapeake Bay in Dorchester County, Maryland, approximately 10 miles south of Cambridge.

The refuge consists of 11,216 acres, of which approximately 10,000 acres are in marsh, fresh-water ponds, or brush and timbered swamps. These swamps contain extensive areas of pine and oak timber. About 900 acres are farmed each year to produce a supplementary source of food for the tremendous numbers of migrant and wintering waterfowl. Several fresh-water impoundments have been developed for waterfowl use since the establishment of the refuge.

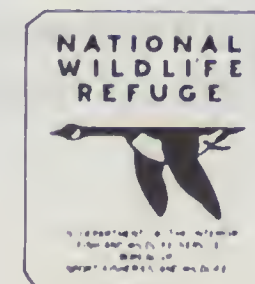
Interest centers around the refuge chiefly during the fall, winter, and spring. When waterfowl reach their peak concentration during November and December, approximately 70,000 Canada geese and 80,000 ducks can be observed on the refuge. The principal species of ducks are mallard, black duck, pintail, green-winged teal, widgeon, and wood duck. During one Christmas Bird Count, Blackwater listed 27 species of waterfowl.

Nesting ducks include the black duck, blue-winged teal, mallard, and wood duck, listed in the order of their abundance. Other nesting species include the Canada goose, king and Virginia rails, common gallinule, killdeer, barn owl, and osprey. The brown-headed nuthatch is a permanent resident in the loblolly pines--near the northern limits of its range.

The following birdlist contains 224 species which represent observations since 1938. An additional 11 species which are rare or have occurred accidentally are placed at the end of the list. Those marked with an \* are present occasionally in winter. Those denoted by a #, normally winter or transient visitors, may nest in limited numbers. This list, using species names, is in accordance with the Fifth (1957) A.O.U. Check-list. Symbols used are defined as follows:



UNITED STATES DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES AND WILDLIFE





<u>Status</u>	<u>Abundance</u>
PR - Permanent Resident	a - abundant
SR - Summer Resident	c - common
WR - Winter Resident	u - uncommon
SV - Summer Visitor	o - occasional
WV - Winter Visitor	r - rare
TV - Transient Visitor	
AV - Accidental Visitor	

Common Loon	WV-o	Black Vulture	PR-o
Horned Grebe	WV-o	Sharp-shinned Hawk	WR-u
Pied-billed Grebe	WV-c	Cooper's Hawk	PR-u
Double-crested Cormorant	TV-o	Red-tailed Hawk	PR-c
Great Blue Heron	PR-c	Red-shouldered Hawk	WV-u
Green Heron	SR-c	Broad-winged Hawk	TV-o
Little Blue Heron	SV-u	Rough-legged Hawk	WV-o
*Common Egret	SV-c	Bald Eagle	PR-c
Snowy Egret	SV-c	#Marsh Hawk	WR-a
*Black-crowned Night Heron	SR-c	Osprey	SR-c
Least Bittern	SR-u	*Peregrine Falcon	TV-o
*American Bittern	SR-u	*Pigeon Hawk	TV-u
*Whistling Swan	TV-u	Sparrow Hawk	PR-c
#Canada Goose	WR-a	Bobwhite	PR-c
Brant	WV-o	Turkey	PR-u
Snow Goose	WV-o	*King Rail	SR-c
Blue Goose	WV-o	*Clapper Rail	SR-u
#Mallard	WR-a	*Virginia Rail	SR-c
#Black Duck	WR-a	*Sora	TV-u
Gadwall	WR-u	Black Rail	SR-r
Pintail	WR-c	Common Gallinule	SR-u
Green-winged Teal	WR-a	American Coot	WV-c
*Blue-winged Teal	SR-c	Semipalmated Plover	TV-c
European Widgeon	WV-r	Killdeer	PR-c
American Widgeon	WR-a	*Black-bellied Plover	TV-o
*Shoveler	TV-c	*American Woodcock	SR-u
*Wood Duck	SR-u	*Common Snipe	TV-c
Redhead	WV-o	Spotted Sandpiper	SR-c
Ring-necked Duck	WR-c	Solitary Sandpiper	TV-c
Canvasback	WV-o	Willet	SR-r
Greater Scaup	WV-r	*Greater Yellowlegs	TV-c
Lesser Scaup	WV-o	*Lesser Yellowlegs	TV-c
Common Goldeneye	WV-u	Pectoral Sandpiper	TV-c
Bufflehead	WV-u	White-rumped Sandpiper	TV-o
Oldsquaw	WV-u	*Least Sandpiper	TV-a
White-winged Scoter	WV-r	*Dunlin	TV-c
Ruddy Duck	WV-u	*Dowitcher	TV-u
Hooded Merganser	WV-u	Stilt Sandpiper	TV-o
Common Merganser	WR-c	*Semipalmated Sandpiper	TV-a
Red-breasted Merganser	WV-o	Western Sandpiper	TV-o
Turkey Vulture	PR-a	Sanderling	TV-r

Great Black-backed Gull	WV-o	Red-breasted Nuthatch	WV-o
Herring Gull	PR-u	Brown-headed Nuthatch	PR-c
Ring-billed Gull	PR-u	Brown Creeper	WV-u
Laughing Gull	SV-u	*House Wren	SR-c
*Bonaparte's Gull	TV-u	Winter Wren	WV-u
Forster's Tern	TV-u	Carolina Wren	PR-c
Common Tern	TV-o	*Long-billed Marsh Wren	SR-a
Least Tern	TV-o	*Short-billed Marsh Wren	SR-u
Caspian Tern	TV-o	Mockingbird	PR-u
Black Tern	TV-o	*Catbird	SR-u
Mourning Dove	PR-c	*Brown Thrasher	SR-u
Yellow-billed Cuckoo	SR-c	*Robin	SR-c
Black-billed Cuckoo	SR-o	Wood Thrush	SR-a
Barn Owl	PR-c	*Hermit Thrush	TV-c
Screech Owl	PR-u	Swainson's Thrush	TV-u
Great Horned Owl	PR-c	Gray-cheeked Thrush	TV-o
Snowy Owl	WV-r	Veery	TV-o
Barred Owl	PR-u	Eastern Bluebird	PR-u
Long-eared Owl	WV-r	Blue-gray Gnatcatcher	SR-u
Short-eared Owl	WR-o	Golden-crowned Kinglet	WR-c
Saw-whet Owl	WV-r	*Ruby-crowned Kinglet	TV-c
Whip-poor-will	SR-c	Water Pipit	WV-u
Common Nighthawk	SR-u	*Cedar Waxwing	TV-o
Chimney Swift	SR-c	Loggerhead Shrike	WR-o
Ruby-throated Hummingbird	SR-c	Starling	PR-a
Belted Kingfisher	PR-c	White-eyed Vireo	SR-c
Yellow-shafted Flicker	PR-c	#Yellow-throated Vireo	TV-u
Pileated Woodpecker	PR-u	Red-eyed Vireo	SR-c
Red-bellied Woodpecker	PR-u	#Black-and-white Warbler	TV-c
Red-headed Woodpecker	PR-r	Prothonotary Warbler	SR-r
*Yellow-bellied Sapsucker	TV-u	Worm-eating Warbler	TV-r
Hairy Woodpecker	PR-u	Blue-winged Warbler	TV-o
Downy Woodpecker	PR-c	Tennessee Warbler	TV-r
Eastern Kingbird	SR-c	Nashville Warbler	TV-r
Great Crested Flycatcher	SR-c	#Parula Warbler	TV-u
*Eastern Phoebe	SR-c	Yellow Warbler	SR-c
Acadian Flycatcher	SR-c	Magnolia Warbler	TV-o
Least Flycatcher	TV-r	Cape May Warbler	TV-o
Eastern Wood Pewee	SR-c	Black-throated Blue Warbler	TV-o
Horned Lark	PR-u	*Myrtle Warbler	TV-a
*Tree Swallow	SV-c	Black-throated Green Warbler	TV-u
Bank Swallow	SV-u	Blackburnian Warbler	TV-o
Rough-winged Swallow	SR-u	Chestnut-sided Warbler	TV-u
Barn Swallow	SR-a	Bay-breasted Warbler	TV-r
Cliff Swallow	TV-r	Blackpoll Warbler	TV-u
Purple Martin	SR-c	*Pine Warbler	SR-c
Blue Jay	PR-u	Prairie Warbler	SR-u
Common Crow	PR-a	*Palm Warbler	TV-c
Fish Crow	PR-u	Ovenbird	SR-u
Carolina Chickadee	PR-c	Northern Waterthrush	TV-r
Tufted Titmouse	PR-c	Louisiana Waterthrush	TV-o
White-breasted Nuthatch	WV-r	Kentucky Warbler	SR-u



*Yellowthroat	SR-a	Purple Finch	WV-u
Yellow-breasted Chat	SR-c	Pine Siskin	WV-u
#Hooded Warbler	TV-u	American Goldfinch	PR-c
Canada Warbler	TV-o	Rufous-sided Towhee	SR-a
American Redstart	TV-c	Savannah Sparrow	WV-c
House Sparrow	PR-a	Grasshopper Sparrow	SR-u
Bobolink	TV-u	*Henslow's Sparrow	SR-u
Eastern Meadowlark	PR-a	*Sharp-tailed Sparrow	SR-u
Redwinged Blackbird	PR-a	Seaside Sparrow	SR-o
Orchard Oriole	SR-c	*Vesper Sparrow	SR-o
#Baltimore Oriole	TV-u	Slate-colored Junco	SV-c
*Rusty Blackbird	TV-u	Tree Sparrow	WV-o
Common Grackle	PR-a	*Chipping Sparrow	SR-c
Brown-headed Cowbird	PR-c	Field Sparrow	PR-c
Scarlet Tanager	SR-u	*White-crowned Sparrow	TV-r
Cardinal	PR-c	White-throated Sparrow	WR-a
Rose-breasted Grosbeak	TV-r	*Fox Sparrow	TV-u
Indigo Bunting	SR-u	Swamp Sparrow	WR-a
Evening Grosbeak	WV-r	Song Sparrow	PR-a

- - - - -

These additional 11 species are of accidental or rare occurrence and have been identified by one or more authoritative ornithologists or field observers.

Cattle Egret	Northern Shrike
Louisiana Heron	Solitary Vireo
Golden Eagle	Orange-crowned Warbler
American Avocet	Summer Tanager
Yellow-bellied Flycatcher	Bachman's Sparrow
Black-capped Chickadee	

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#### NOTES

RL-147-R-3

Issued: June 1955

Revised: September 1965



1965

Dec. 21 - Blackwater, National Wildlife Refuge. south of Cambridge, Md.

An area of open fields, thickets, pine woods, ~~and~~ ponds and "creeks", marsh and swamp.

Just inside entrance in open field on right, 100-200m from road huge numbers of Canada geese were feeding, most with heads down, a few with necks stretched up - lookouts? One snow goose.

Other flocks also seen off to right in other fields.

In large ponds back of refuge headquarters on right of road to picnic grounds, many thousands of Canada geese in water and out on land. Small flocks of mallards - heads brilliant metallic green in sun, mostly males, excitedly swimming around.

When frightened enormous numbers of geese flew up, their combined calls making an impressive mass of sound.

Ranger says 2 weeks ago there were 100,000 geese on refuge. 10,000 out of 11,000 acres are marsh & swamp.



Jan. 1 - Corbin Cabin and  
Nicholson Hollow

The stream (Hughes River)  
near the cabin almost  
dry - pools with a trickle  
between them. Spring dry.  
Weather comfortably warm.

Several insects seen -  
a tiny beetle, a tiny moth  
and one or two mosquitoes,  
a spider.

There is an unusual  
amount of hemlock  
in the valley between  
2000 and 1000 feet - many  
large old trees and thousands  
of saplings to 3 m. tall.  
These are more abundant  
along the trail (which is  
an abandoned road) than  
back in the woods  
away from it.

Jan. 1 - Nicholson Hollow  
at confluence of Hannah's Run  
with Hughes River.

in brook below spring  
*Chrysosplenium americanum* Schwein.

Jan 1 - stream between Hot Mt.  
and Short Mt.

Thickets in stream bed  
5 56 *Alnus serrulata* Willd.

labels  
written

47755

4

labels  
written

5

56

~~the~~ *Chrysosplenium*  
formed a localized mat  
in the outwash from  
a spring just above  
the confluence of Hannah's  
Run with Hughes River,  
between them on the  
flattish valley bottom.

The Hot-Short Trail  
is a steep trail up a  
wet ravine between the  
two mountains. In the  
bottom of the ravine at  
about 2000 ft. is a clump  
of large *Alnus*, probably  
*A. serrulata*, as the trunk  
is not speckled with  
white lenticels.

1000'

prostrate, forming a  
localized bright green mat.

2000'

shrub 4-5 m. tall, stem  
without white lenticels.



Jan. 23 - flight from Chantilly to California (L.F.)

left Dulles at a minute or two after 9 a.m.

The ground ~~is~~ <sup>is</sup> covered by snow an inch or two deep. Some sticking to the branches of the trees. A slight drizzle of tiny flakes.

One bit of young conifer plantation adjacent to airport.

Almost immediate cloud layer below. No visibility of ground from just after we left airport.

At 9:45 a large opening in clouds showed a very large, very irregular reservoir north of a curved (bowed south) snow-covered flood-plain.

Then, in distance to north a much larger reservoir extending n.e. - s.w. with a very narrow neck in middle and a curved projection south and east, almost to corner.

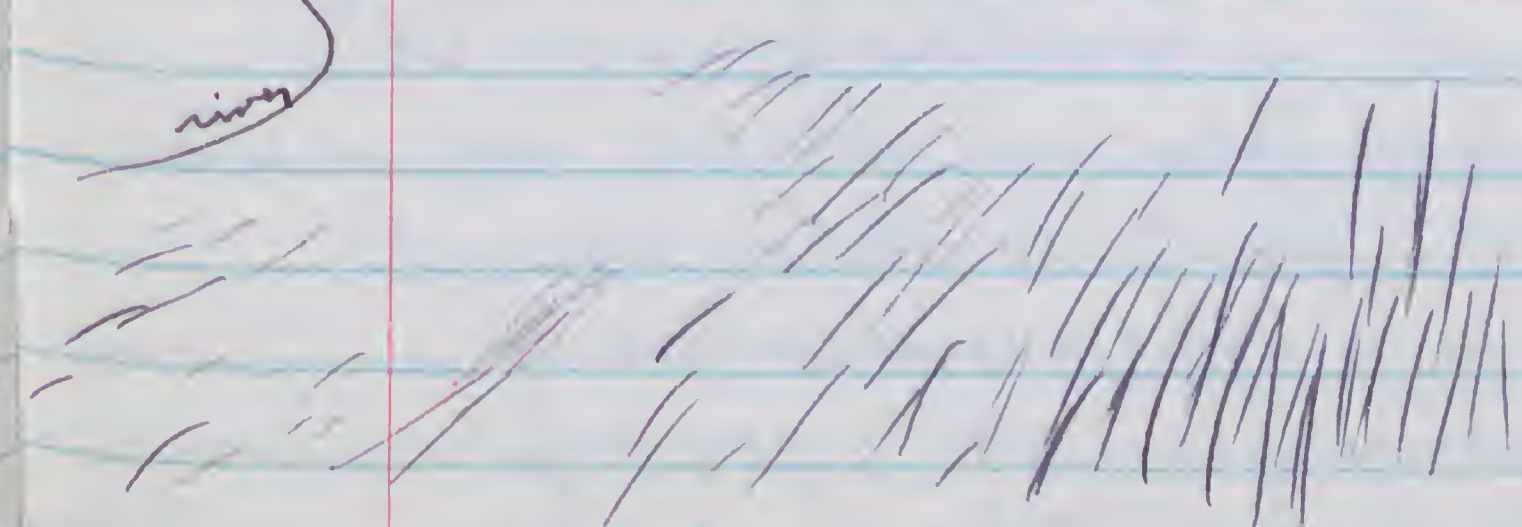
A large city on a large river s.w. of it - probably Parkersburg, W. Va. on Ohio R.

Clear from here on west, snow-covered. Completely cultivated with scattering of small woodlots. Meandering streams trending south or southwest. After 10 minutes, clouds again.

10:17 passed west shore of Lake Michigan. Snow on ground, mostly cultivated, a strip of small hills, ravines, frozen ponds, running west of south, diverging from lake shore.

West of this scattered moraine remnants, drumlins, etc. oriented n.s. Beautiful display of parallel oriented drumlins, emphasized by snow, give a "grain" to country, n.s. but fanning a bit to westward, the fanning becoming more pronounced until it is almost n.e. - s.w. Perhaps there are gouged troughs as well as drumlins.

river



striations actually much more close together.



1966 Va. - Calif  
 (Wis. Iowa - ~~Ill.~~)

10:39 A very intricate pattern of low but steep hills, on north side of large w. s. w. trending river, quite extensive to north and west. Perhaps the Driftless Area. South of river, also. River has large, braided flood plain. Drainage patterns in hilly area are closely dendritic, or almost labyrinthine. The tops of the hills and the bottoms between them are bare, the slopes wooded.

Crossed Mississippi at 10:42. Braided flood plain, dam, large impoundment. Very intricate pattern of wooded bars below dam, also above impoundment.

Hill pattern continues west of Miss. R. but becomes less sharp, hills lower and broader, gradually fades out to intermittent rolling plain, only a few small woodlots in the areas of plain. These separated by strips of hills each along a meandering eastward flowing river; conspicuous dendritic pattern, fading westward

into open, snow-covered plain.

10:50 Here rivers are marked by very sparse gallery forest, farm-yards marked by tufts of trees. Rivers trend eastward, southeastward, to southwards we go west. Perfect square pattern of roads outlining section (a quarter section?) blocks of land, with rather evenly distributed sparsely scattered farm-yards with their clumps of trees. A few small villages.

A few small streams lined by trees.

Lines of reservoirs, frozen and snow-covered, outlined by rows of trees or bushes, along some streams.

11:07 Crossed large, rather straight river, running s. s. e. in slight-ly incised channel.

Then clump of reservoirs, or potholes, others scattered.

11:15 Vast, open, snow-covered country. Still the square road pattern.

11:19 A smoky streak stretching across the country is apparently the shadow of our own jet-trail against the snow - very odd! It extends a bit in front of us, advancing with us.



1900

at times the shadow is double.

12:15

Dissected country with beautiful drainage systems. Crazywood Wyo. Then the front range of the Rockies - a gap of a large river through red rock strata. South of this rugged canyons. Then bold mountainous country with deep but broad valleys. Then clouds.

A bit west of this a canyon system draining north-west. Then a series of curved ridges along a n-s. river. and another drainage entering it from the west. This drainage and another to the west impinging on each other. Trends hard to make out because there is so much snow. Apparently to north. Large streams and canyons converge that way.

12:27

A striking range to north, deep canyons coming southward from it.

Far to north a much larger range. Wonderful sedimentary escarpments just north of course. The snowy range

to north may be the Grand Tetons - not familiar from this angle.

Tremendous incised fan-shaped drainage to this side of it.

12:32

Crossing a great range, with spectacular canyons cut in east slope. Great snow-fields on erosion remnants between them. These are flattish topped ridges, heading up to a terrific range of sharp peaks, then a deep canyon with precipitous walls running north. and west of it, in the interval between it and a broader valley, a jumble of rugged forested peaks.

An open broad basin, more peaks to north of it. Broad somewhat dissected valleys, wooded ridges between them. High snow peaks to north.

12:38

Then more rough country - deeply cut, very snowy partly wooded.

Clouds.

1:35

A large deep lake, surrounded by and mts covered by a sparse



10:40

growth of pinyon - Mono Lake?  
East front of Tierras.

10:43

Much snow  
Lake Tahoe in distance. A  
beautiful little lake muddy  
recess, in a deep canyon.  
Another, on course, lower  
in same canyon, this one  
with broad bare shores.  
Vast wooded dissected  
area with little snow.  
Very deep V shaped canyon  
below lakes.

Jan. 25 - Mayer Ranch.  
West of Modesto on Mayer Rd.  
Several areas of  
irregular ground,  
highly alkaline, with  
low mounds. Part is the  
alkaline area visited  
~~several~~ several times  
previously. Part, rather  
extensive, 1 km ± farther  
west. Distichlis is  
abundant here.

Mar. 5 - Capitol Hill

*Stellaria media* and  
*Laminium amplexicaule*  
(form with cleistogamous  
flowers) are in full  
bloom in lawns and  
waste spots.



Mar. 12 - Wooster

Echo Hollow

Ravine cut by small stream in flat-lying shale.

Forest of oaks <sup>white,</sup> (red, black?) beech, tulip.

Many planted small hemlock, a few white pine, Ilex, Magnolia, all planted.

*Polystichum aculeatum* very common. Mosses abundant.

Head of stream very much ramified, springs that feed the rivulets are at various levels, on clay beds and between shale beds.

Carpinus, what appears from bark to be a large *Betula nigra*, etc.

Many birds, chipmunks, and a small reddish gray squirrel, with form, tail and movement of a red, but colored like a hybrid.

Mar. 12 - Apple Creek, outskirts of Wooster

*Tussilago*

edge of gravelly stream bed

47757

Where stream comes out ~~from~~ ~~side~~ through low bluffs into broad flood plain of Apple Creek there are thickets of *Crataegus*. Tangles of an introduced *Rosa* - very prickly.

In flood plain much open weedy rolling ground, marshy spots and abundant irregularly distributed *Platanus* - large trees, a few enormous but hollow.

Creek meanders across plain - on other side where it cuts into a portion of the opposite bluff a sedimentary section is exposed that appears to be <sup>glacial deposits</sup> a ~~main~~ <sup>main</sup>, rather than the shale, - bedded but irregularly and not well consolidated. This bluff well wooded with medium second growth.

heads on fleshy scaly shoots.  
disk & rays bright yellow.



Mar. 25 - from plane at high altitude - the entire northwest England seems snow-covered.

Mar. 27 - trip by train to Reading -

A few trees are beginning to leaf out, most are still quite bare. The ground is generally green with grass.

Factories, housing, etc. generally in sight. Open fields at and beyond Iwer. Hedgerows of *Crataegus*, etc. *Foraythia* in full flower.

One small patch of woods between Iwer and Reading.

More and more factories as Reading is approached.

5 minutes from Reading a grand and beautiful rolling open park-like country. Many trees in hedgerows - *Populus nigra*, *Pinus sylvestris*, ~~and~~ *Betula*, many others.

Maidenhead Jct.

Then extensive beautiful open rolling country with no factories. A few tiny villages and scattered large houses.

A patch or two of gorse on RR cuts.

Weyford Sta.

Flat open country with

conspicuous hedge-row-pollarded trees. Small patches of woods near a golf course. Gorse in flower on r.r. cut. *Salix babylonica* leafing out. Oaks & birches not yet putting out any leaves, nor beech nor poplar.

A fairly large river on right. Banks very low.

Shefford Woodlands -  
+ photo of F. F. Darling house.

Kennett Valley - low chalk hills - oak-hazel copses on steep slopes and in ravines.

Brick & flint construction, thick thatch roofs.

Marlborough

Agbourne St. George

High chalk hills, not much woody veg.

West of Marlborough the hills flatten out. Some of construction is of "sarsen" or dense sandstone. Rolling country, chalk, with scattered sarsen boulders, "barrows" on knoll tops.

Avebury - long double row of sarsen megaliths more or less unbroken - then an enormous circle of erect sarsen



stones surrounded by a deep ditch. The town of Avebury is built in (and of) this circle of stones.

Savernake - an old forested area, now locally degraded by attempted agriculture and very spotty and thickety, with locally old beeches & oaks.

The soil on the chalk is of varying shades of brown, made light by a high content of flint nodules.

Trip back by train from Newbury via Reading to London - the flat flood plain of the Kennett River, largely cultivated, has a very dark brown or gray-brown soil.

Darling says that the Downs soils had a good humic layer which was depleted by 3 years of wheat culture. Then barley was planted, with about a half ton of chemical fertilizer per acre, and this has continued.

The surprising thing about this Down landscape is that there are no signs of gully erosion. That there has been sheet erosion is shown by the accumulation of fine dark material in the flood plain.

Darling's house rests on a low plateau bearing about 20' of clay - a very stiff clay, with some flints. An old Roman road went across it, and where it went the grass is thinner, yellower, but tougher. A broader place of this sort, he showed me, he says must mark the site of a post house or building of some sort.

This stiff clay could not be worked efficiently with horses, but is now worked with tractors, so the sheep culture has been replaced by ~~the~~ grain culture.



Mar. 29 - Monks Wood  
Experimental Station

Fine lot of building  
including living quarters  
for 12 people.

Nature Reserve -  
the corner of it nearest  
the station buildings  
is a small closed forest  
about ~~10 m~~ <sup>10 m</sup> tall, of oak,  
Fraxinus, etc., with  
a sparse shrub layer  
of Ligustrum (?) 2 m ± tall,  
and a low layer 20-40 cm  
tall of Rubus sp., with  
occasional patches  
of grass. On the  
ground, both in the  
Rubus and the grass  
is a layer of moss  
(Thuidium sp.?), with  
occasional Viola sp.  
Mercurialis local in  
the woods, more common  
along paths.

In farther Betula  
becomes common.

Some clearings. Some  
harvesting of Corylus poles, to  
be made into coppice.

Rosa canina and R. arvensis

Mar 30 - Woodwalton Fen.

The only remaining <sup>undrained</sup> ~~undrained~~ part of the Huntingdon  
Fens.

Formerly a limy bog, but  
since drainage, 100 years ago,  
woody vegetation has come in.  
Is now a swamp, of low scrub  
forest of Salix spp. birches locally.  
Was mostly cut over long ago  
for peat for burning.  
Peat is 4 m thinning  
southward to 1 m.

Patches of Phragmites.

Rosa canina - great hooked prickles.

Management activities to  
maintain or increase biological  
interest, to increase richness  
of biological ~~and~~ communities.  
Otherwise would revert to  
a very few poor communities -  
Phragmites, willow, etc.

Only 1 sq. mile of fen left,  
so they are trying to maintain  
as near ~~to~~ as much as possible  
of original diversity of the  
whole fen.

Viola spp., Anemone nemorosa,  
Primula vulgaris, Mercurialis  
perennis, ~~in~~ Fraxinus, in fl.  
Prunus spinosa in bud.  
Corylus in fl.



The old situation was apparently that on the alkaline peat there was a tendency to form acid peat and raised bog. There has been peat cutting for many centuries, resulting in less of this acid peat.

The invasion of the willows, ash, alder, birch, *Fraxinus* etc followed drainage.

*Tussilago* and *Stellaria media* in flower on dyke sides of drainage channels.

~~But~~ Southward the acidity is greater and *Betula* becomes dominant. Patches of *Myrica gale* + even some *Calluna*.

Then *Myrica* forms a shrub layer in *Betula* forest.

In a rather dry area they are experimenting with the encouragement of rare plants (eg *Dianthus armeria*) by grazing by cattle. These areas, when grazed off, show hummocks which are said to be ant hills.

April 1 - Trip by rail, Huntingdon to London.

Generally open, slightly rolling agricultural country. Moderate sized fields, some hedges. Willows lining Ouse R. along which r.r. runs at times. Some large oaks, etc. lining roads and in hedges. General dull light brownish soil. Some small brooks.

St. Neots South of this there tend to be less hedges. Some small patches of wood and copses. Left side more hilly and more woody. R. side flatter.

Sandy. Some conifers <sup>Pinus</sup> in wooded patches on left, mostly deciduous.

In hedges *Hedera* is climbing in many of the larger trees, clothing trunks and bases of larger branches. Biggleswade.

Flat land - some truck gardening. Some hedges.

Then rolling land. Soil grayer. Then an area with some swamps, fens, pastures, etc. some cultivation. Then more hilly, grayish gravel. Hitchin - R.R. cut in chalk south of station.



Mar. 30

Woodwalton Fen, Hunts.

417758

*Phragmites communis*locally abundant, forming  
brakes 1.5 - 2.5 m. tallMar. 29 - Monks Wood Nature  
Reserve, Hunts.

59

*Mercurialis perennis*very common in and  
around second-growth forest

Mar. 31 - same

60

*Anemone nemorosa*locally very common  
in second-growth forest  
of *Betula* and *Corylus*

April 1 - Trip (ctd. from 129).

Rolling land. Occasional  
small woodlots.Some gorse in flower on  
road cuts.Stevenage. Rolling land  
to south. Cult. on left, green  
park-like pasture with  
rows and tufts of forest on  
right.Knebworth. Rather hilly  
land. Tunnel. Trees prominent.Welwyn North.Welwyn Garden.erect canes, leaf-blades have  
been shed, sheaths persistent.spreading by rhizomes,  
forming loose patchesspreading by brownish  
rhizomes; flowers  
white, purplish without  
3 petals, 3 sepals.



April 3 - Forêt de Fontainebleau

Large open areas of heather with scattered *Betula* and *Pinus sylvestris*.

The birch is much more abundant than the pine.

In places the birch forms an open forest with a dwarf shrub layer, more or less continuous, of *Calluna*. Here and there a few patches of a thin layer of chalk, but scarcely enough to change the vegetation. *Anemone pulsatilla* is occasional around these chalk patches.

*Potentilla* common generally, in flower.

Large valleys are eroded in the sandstone. Apparently the beds of sandstone are unevenly consolidated and on the rims of the valleys lower unconsolidated material has been removed, the upper hard beds break off in large slabs which lie on the upper slopes, inclined toward the valley, separated by great cracks or chasms. In these are *Polypodium*, *Calluna*, *Pteridium*, *Lonicera*, *Betula*. Much *Umbilicaria* & other lichens on rocks.

In the areas of beech forest there is a dwarf shrub layer, rather discontinuous, of *Ruscus*.

The beech trees have an abundance of small branches low on the trunks. These have persistent dry leaves, while the upper branches are bare.

There has been a great deal of recent cutting of trees in the beech and mixed beech + pine woods. Thousands of trees are on the ground in various stages of tumbling and being cut up for logs and cordwood.

~~Some~~

Rabbit droppings are very abundant on the heath areas, showing that resistant strains to myxomatosis have developed.

Across valley is a dense stand of pine - perhaps fire did not reach it.

In valley bottom in places *Pteridium* replaces *Calluna* as ground cover, but only locally, in other forest.



Lower down the valley small *Quercus* become common mixed with the birch and pine.

Ph. Wolf has planted a sedum brought from Germany at various places in the forest.

A large treeless area is alternate boulders or outcrops of sandstone and boggy depression and pools. In the drier of these are *Calluna*, a large grass, and *Polytrichum cf. commune* in abundance. *Pinus sylvestris* seedlings or common birch seedlings abn. But all trees over 2 cm diam. seem to be dead. There are scattered dead stubs up to 7-8 cm. diam. *Phragrum* in some wet depressions. *Scirpus* and *Calix* are local in some pools.

April 2 - Forest de Fontainebleau

n. w. of Fontainebleau

47761

*Anemone nemorosa* L.

common in *Fagus* forest with patchy dwarf shrub layer of *Ruscus*

The pattern of roads in the forest is generally of straight roads at various angles to each other. This is mostly true even of tiny wood roads, as well as paved highways.

April 3 - trip by car to south from Fontainebleau.

Forests largely *Pinus sylvestris*. Just before Lorgues, new road cuts through deep white sand hills, with thin beds of brownish sand.

Loing R.

Epiry.

Flat cult. valleys separated by low sand hills or knolls, with evergreens on them.

Etang de Villeneuve, a pond surrounded by *Phragmites* - a narrow belt.

Planted forests of Austrian pine. *Pinus nigra*.

Rebours, attractive village of masonry construction. Large open fields.

Villeneuve

(next p.)

*Ph. rhizome* glossy brown; flowers white, purplish without, part of perianth usually 6, but as many as 8.



S. of E. toward Montmey,  
 Low hills or knolls, grassy  
 with scattered small  
*Juniperus communis*, *Pinus*  
*sylvestris*, *Quercus*, *Crataegus*.  
 Very disturbed. Hills are of  
 a conglomerate limestone. Thin soil.  
~~From~~ Montmey

## Boisroux

Small open flat cult. valley  
 Villermarechal  
 Open cult. low plateau,  
 no hedges. Then coppice  
 mostly deciduous woods.  
 Les Gros Ormes.

Low narrow flat valley,  
 semi-open. Striking display  
 of ~~Vaccinium~~ *Viscum* in trees.  
 An old

## Forrey le Bocage.

An old Chateau

S. E. through small valley  
 Villenouette.

Hills along valley wooded.  
 Valley cult.

## Vaux

Open low plateau, a few  
 trees and thickets. Much  
*Viscum* in trees.

Villeniard - chateau.

## Cheroy

Rolling country, many  
 patches of wood, much  
 cultivation. E. of Cheroy.

## S. to Montacher

S. over low rolling plateau.  
 small patches of woods.  
 a few hedges, cult. gray-brown  
 soil. *Prunus spinosa* (?)  
 abundantly flowering.  
 scattered trees and small  
 orchards with much *Viscum*.  
 Etang de Galetas - small  
 lake. Margins pastured.  
 Thickly wood with  
 much *Crataegus*.  
 Thin *Hedera*, *Vincetoxicum*,  
 etc. on ground.

## Donats

S. & S.W. partly open cult.  
 land, partly wooded with  
 small deciduous trees.

Bois de Bremaux - large  
 trees being cut.

Then part not recently  
 disturbed.

Small pond. Some *Juniperus effusus*.  
 toward St. Hilain - open  
 forest with brushy thick  
 understory.

Another small lake.

and another, surrounded by  
 a belt of woods. "Pêche privée".  
 Artificial lake - swampy  
 ground below dam. A yellow  
*Primula* common in mud.

In pasture *Bellis* and *Taraxacum*  
 flowering, ~~also~~ common.



Turned west and then again south, then west or north west. Through undulating semi-open country. toward Chantecog, a nice little village on the valley side. Scattered trees in fields.

The hills are chalks, with thin soil.

St. Loup, with a very picturesque little church and not much else.

La Selle sur le Bied.

This is the valley of the Cléry. Mostly open, grassy & cult. some woods, mostly on rougher ground, such holes, etc. Mostly coppice and small trees, saplings, etc.

Several straight strips of woods, obvious windbreaks.

Griselles

Mostly open, cult. land.

Ferrières - considerable place. Central part is an old walled town. Very interesting old church.

Fontenay sur Loing.

Main road back to Nemours.

Crossed R. Loing to left.

Low swampy flood plain.

Canal. Nargis.

Canal bet Seine & Loire.

Wide open fields on a low

plateau.

Les Ganthiers

Château-Landon.

Fine old abbey, a small Roman chapel and an old church with a most interesting bell tower. Good stone work north of this wide fields no hedges. The farm yards in this whole area tend to be walled in by buildings - very substantial establishments.

Foubert - Loing.

Back on main road to Nemours.

Glandelles

Chalk hills with abundant juniper forming open, rarely closed scrub. In places scrubby forest of *Pinus sylvestris* & *Quercus*. The stone is a limestone conglomerate.

Turned off to Pailigney, then north and west through pine, oak & birch wood.

Then a large area of heather on white sand, open forest, called the *Mer de sable*. Large boulders.

Then thin coppicing forest. All of this is the Bois de Nanteau.

Went around Nemours and



crossed super-highway.

Moncourt

La Genevassie

Some maize produced here,  
stored in long wire cribs.

Sides of valley open, cult.

Flood plain with woods and  
thickets.

Epiery.

Large canal.

Loing R.

Laques

Bois de Fontainebleau.

Get advice from Walton Smith  
as to how to proceed. who  
knows what.

Arundel would contribute to  
a study of sand. fly ecology.

Clint Murchison

Grove

Marion Cartains

Francis Francis

Grand Bahama I. is  
easy of access, easy  
travel, boats, relatively  
inexpensive.

Grand Cay is Arundel's

Large area of underwater  
dunes. Also sand flats.

Hurricane Betty (?) no rain,  
deposited salt. burned  
foliage.

Will be in June for 2-3 weeks.

Arundel could supply guide for  
local area.

Boats - Walton Smith may  
have, could loan or hire  
them, from Marine Lab.

Arundel has <sup>one</sup> on his island.

A number of tracking stations  
surface contract to Pan American Airways  
or inners outer Bahamas.

Most of habitable islands are  
privately owned - owners would welcome  
Visit Miami station or Eluthers.

Grimmer has a station  
on Grand Cayman



Apr. 24 - 5 mi. n. of Gainesville  
in edge of open grassy  
field along highway

47762 ~~Myrica~~ *Lithospermum arvense* L.  
abundant

3 63 ~~Lepidium~~ *Thlaspi perfoliatum* L.  
abundant

April 24 - Wildcat Mt. preserve

2 Gray squirrels  
crows  
grackles

*Cercis* just coming into  
flower.

*Rivodendron* - tiny green  
leaves.

*Amelanchier arborea* -  
leaves fully expanded  
but not full size yet.

*Dentaria laciniata*  
just past flowering

in deciduous forest on  
west slope

1 64 *Quercus prinus* L.  
common

1 65 *Woodsia obtusa* (Shreng.) Torr.  
occasional on rocks with very thin - soil.

4 66 *Ligustrum vulgare* L.  
local, near old dump

flowers white

flowers white.

*Cornus florida* - leaves  
beginning to open.

*Rubus idaeus* - <sup>50m</sup> below cliff  
near dump. sterile.

*Viburnum prunifolium*  
leaves unfolded but still  
very small.

*Sanguinaria* - past flowering

large tree, bark rough;  
twigs on ground, <sup>probably</sup> clipped by squirrels

shrub, 1 m. tall, with  
young leaves and last year's blue fruit.



47767 *Viola papilionacea* f. *albiflora* Guss.  
 a few plants around old  
 dump, (many seen at  
 Arundel House).

2 68 *Arabis laevigata* (Muhl.) Poir.  
~~fairly common~~ occasional  
 on rock outcrops and  
 at base of trees.

3 69 *Prunus mahaleb* L.?  
 one tree seen near old dump.

2 70 *Barbarea verna* (Mill.) Asch.  
 locally common on  
 rocks and thin soil.

May 1 - Shawangunk Mts.  
 about 2 mi. s.w. of Mohawk Lake

1 71 *Lonicera canadensis* Batsch.  
 at foot of small quartzite cliff  
 in mixed, mainly deciduous woods.

flowers almost white  
 with ~~deep~~ purple patches  
 on petals, yellowish in center.

herbage somewhat  
 glaucous; petals  
 greenish white, not  
 showy.

scrubby low tree  
 or large shrub; petals white,  
 petals yellow.

300 m.

shrub about 1 m. tall,  
 corollas pale greenish-buff,  
 tube gibbous at base.



1966

April 29 - trip by car from  
Falls Church to Lake Mohonk, N.Y.

Forests in Washington  
area fairly green, even the  
oak leaves fairly large,  
though still hanging and  
woolly.

In New Jersey only the  
willows are bright green.  
*Salix babylonica* and another  
tree willow, not weeping.

In New York, north  
of Suffern, N.J. and  
adj. near Newburgh,  
none of the trees show  
much if any green.  
*Populus* covered by green  
catkins. *Acer rubrum*  
are in flower.

*Nymphoides* (?) (water star flower),  
introduced accidentally  
has become a nuisance  
in another reservoir.

On Skytop is a small  
colony of *Potentilla tidentata*,  
at somewhat over 1500' elev.

April 29 - Lake Mohonk

Mixed forest along ridge  
with conifers generally  
more abundant on n.w. slopes.

During last several  
years of drought a great  
many *Pinus rigida* have  
died. Those on very dry  
quartzite outcrops and  
those on moist, favorable  
sites have not suffered, but  
mostly those on intermediate  
slopes. Could these be ecotypes,  
or merely conditioned individuals?

Ericaceous shrub layer  
of *Kalmia*, *Vaccinium*, etc.  
Low *Vacciniums* have  
suffered some from drought,  
upper growth being dead.  
75% of *Kalmia* have been  
killed back, are weakly  
sprouting from lower old wood.  
Some *Quercus ilicifolia* in  
open parts of forest.

On trail to Skytop *Quercus*  
*prinus* is principal deciduous  
component of forest. *Pinus*  
*rigida* and *P. strobus* are  
commonest pines. Some *Tsuga*.

*Fontinalis* is pest in reservoirs -  
floats when cold acid water  
is pumped in.



May 1 - Drive on Shawangunk Mt.  
NW. slope has considerable  
hemlock and some white  
pine. Cape Lookout.

Photos of "Trappes" mt. with  
*Pinus rigida* in p.g.

Large patches of *Kalmia*  
scrub under deciduous wood  
with scattered pine & hemlock.

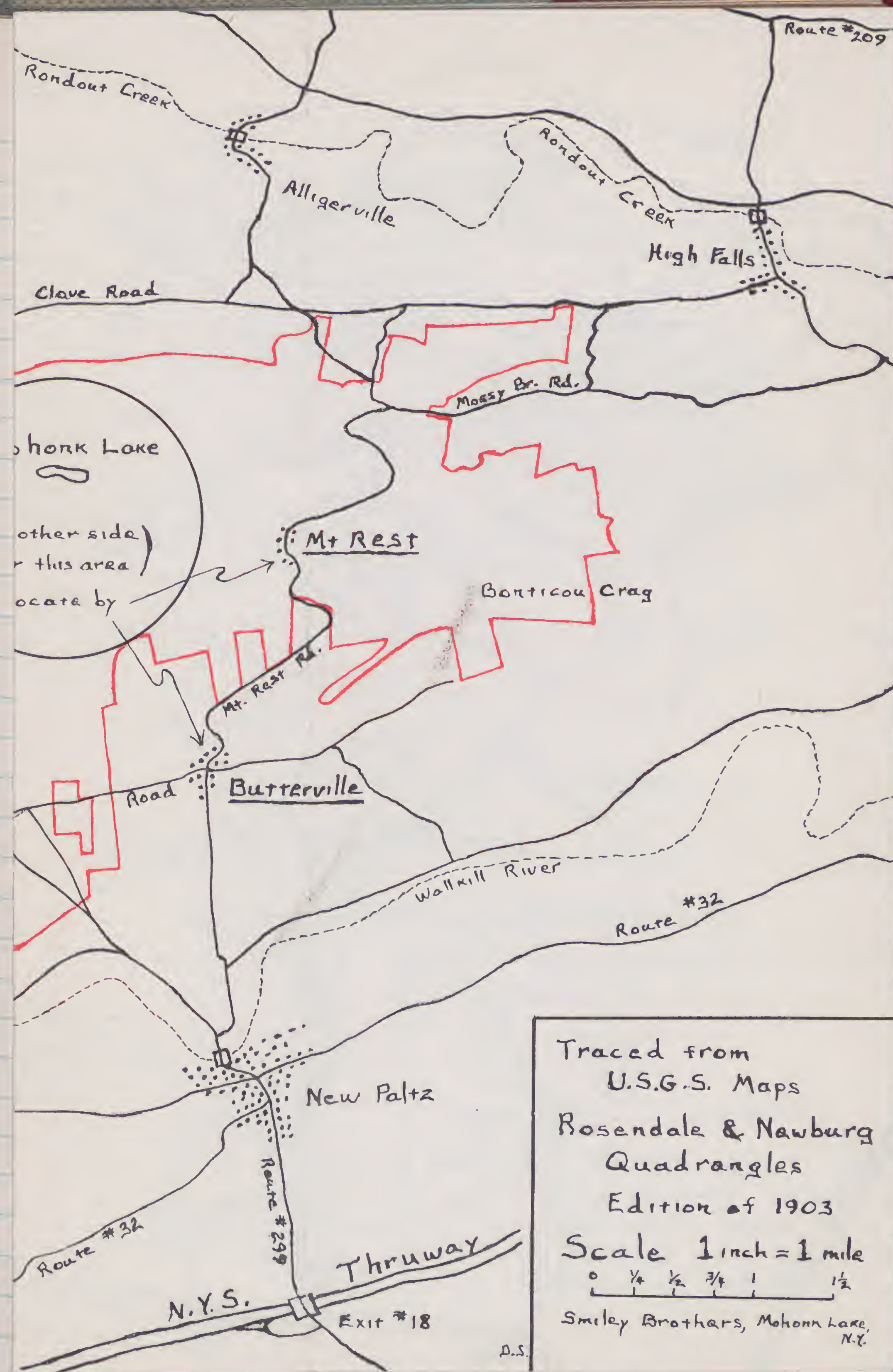
F.E.S. says *Kalmia* seedlings  
only come on bare mineral soil  
in open.

*Rhododendron maximum*  
swamp - hemlock, yellow  
birch, white birch.

Discontinuous *Rhododendron*  
scrub. Lush patches  
of *Lycopodium lucidulum*,  
some *L. annotinum*. *Lucidulum*  
growing also in standing water  
near cold spring. This swamp  
along old road in flat bottom  
of valley. Rhod. possibly  
planted by old Mr. Smiley.

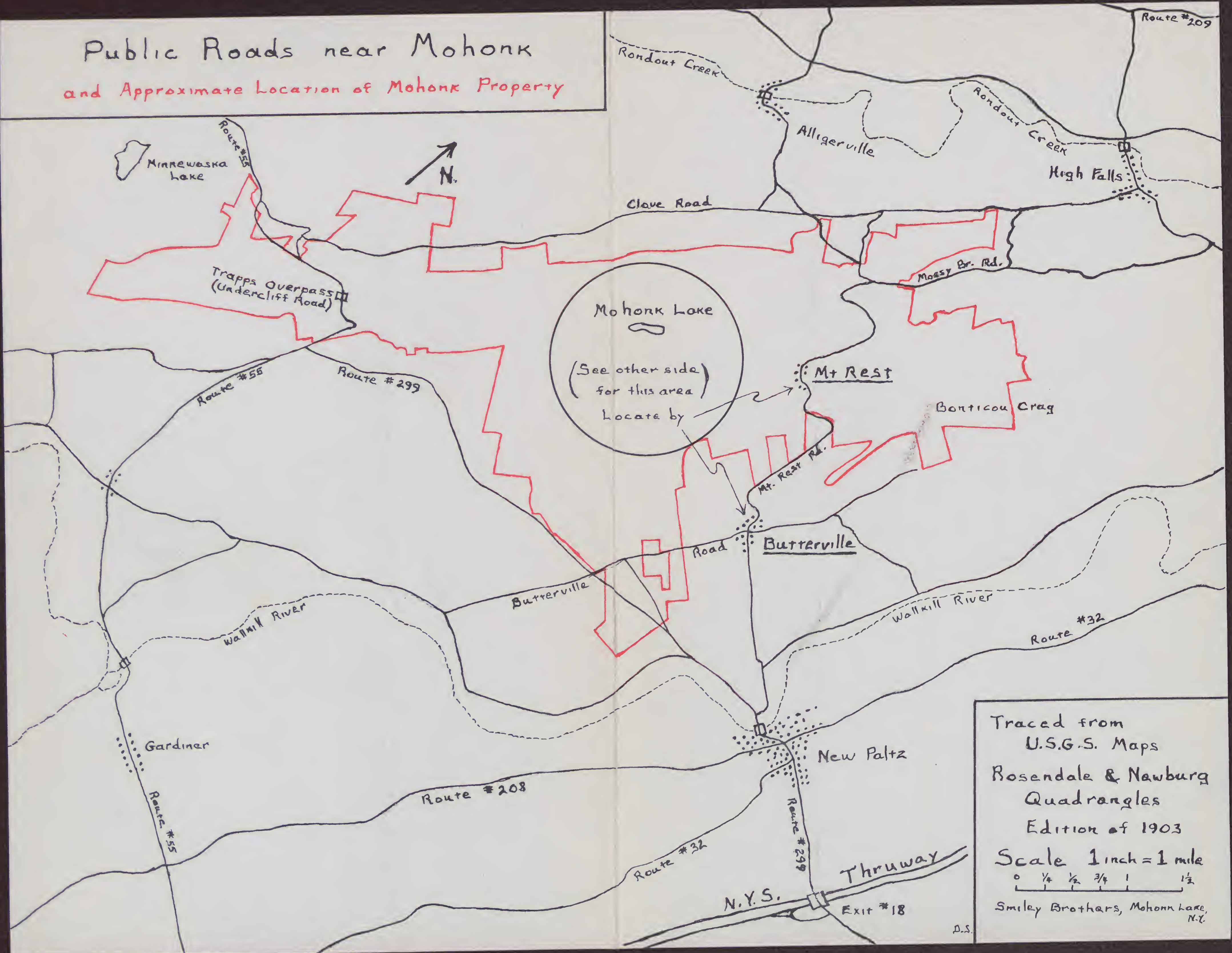
The standing water with  
the *Lys. lucidulum* is all year  
round, acc. Dan Smiley.

Steep slope, burned in  
spring 1927. <sup>glaucophora</sup> *L. lucidulum* with good  
open over story of *Pinus rigida*.  
Most of it rather sparse  
scrubby oak forest with

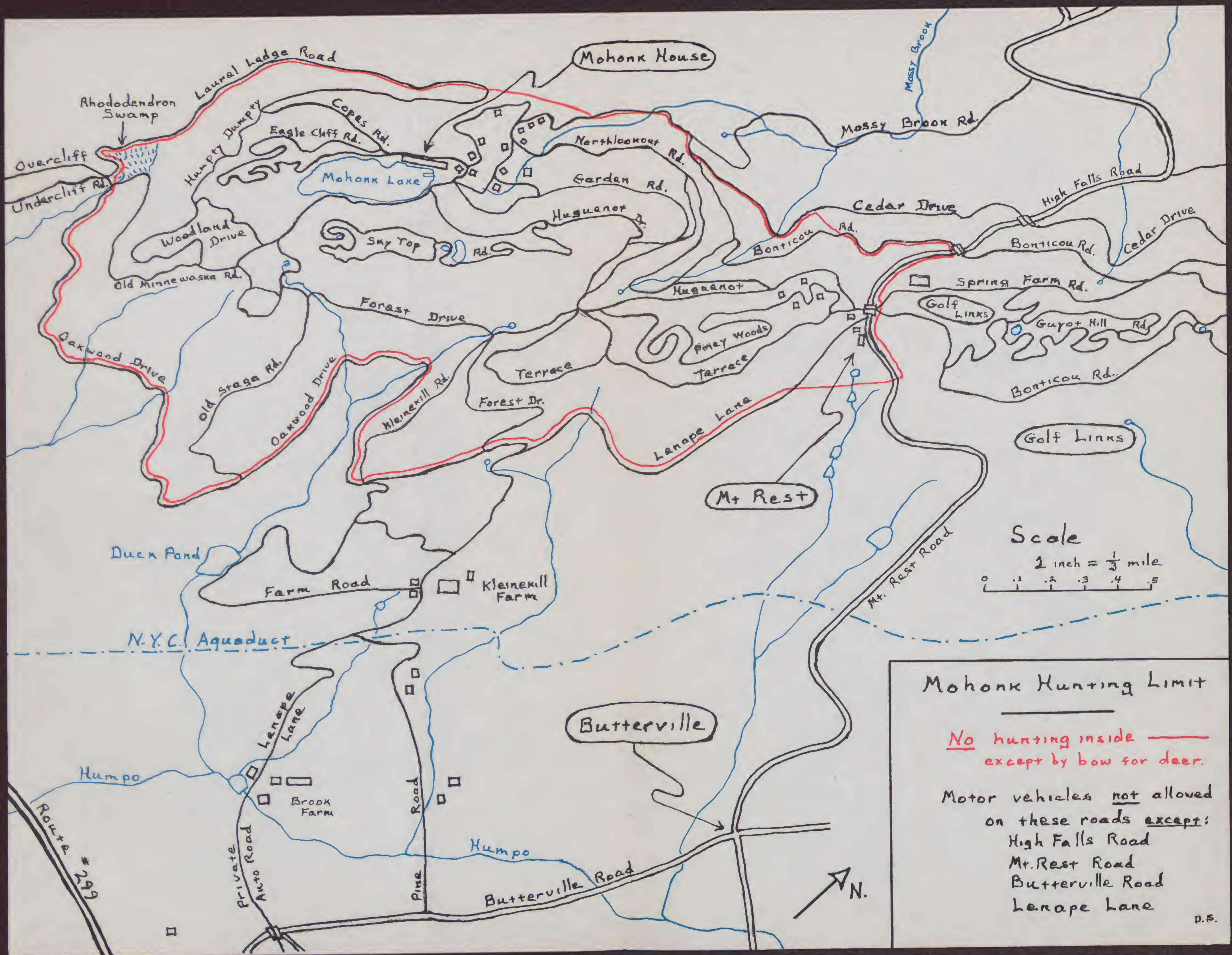




# Public Roads near Mohonk and Approximate Location of Mohonk Property







### Mohonk Hunting Limit

No hunting inside ———  
except by bow for deer.

Motor vehicles not allowed  
on these roads except:  
High Falls Road  
Mt. Rest Road  
Butternut Road  
Lenape Lane



May 1 - Drive on Shawangunk Mt.  
NW. slope has considerable  
hemlock and some white  
pine. Cape Lookout.

Photos of "Trapper" mt. with  
*Pinus rigida* in p. 9.

Large patches of *Kalmia*  
scrub under deciduous wood  
with scattered pine & hemlock.

F. S. says *Kalmia* seedlings  
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*Rhododendron maximum*  
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planted by old Mr. Smiley.

The standing water with  
the *Lys. lucidulum* is all year  
round, acc. Dan Smiley.

Steep slope, burned in  
spring 1927. <sup>*platanus*</sup> ~~herb~~ with good  
open over story of *Pinus rigida*.  
Most of it rather sparse  
scrubby oak forest with

a few pines.



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1966 Virginia

May 2 - Sleepy Hollow.  
*Cornus florida* is fully  
out.

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155







